

Cultural Values Change in the Rehabilitation of Historic Schools in Portugal

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This thesis is dedicated to my family

Despite the importance of the preservation of the historic built environment for the benefit of present and future generations, there is a lack of knowledge of the effects of architectural rehabilitation decisions on the cultural significance of historic buildings. Architectural heritage conservation literature has focused almost exclusively on providing principles and guidelines, describing intervention methodologies, and discussing predicted impacts of design on material values. This thesis argues that a focus on the actual effects is needed if the sociocultural sustainability of historic buildings significance is to be achieved. Supported by an extensive literature review and informed by personal insights from the researcher's everyday practice, an adapted model of the Theory of Change based on Weiss (1995) was designed, providing a tool to evaluate the effects of rehabilitation on cultural significance [ERECS].

Using a selection of six recently rehabilitated historic secondary schools in Portugal (*liceus*), this research investigated architectural decisions and their effects on the cultural values of this building typology for education, focusing on three objectives, corresponding to three stages of interventions: understanding the existing cultural significance, identifying the design strategies applied and assessing the short-term effects of design decisions on the cultural values. Stressing the role of stakeholders in rehabilitation processes, data were collected from the buildings and architectural projects, the decision makers in the conservation process, and the school community.

Although confirming that the evaluation of the effects of architectural decisions on cultural values is a complex task, the findings demonstrate that the historic *liceus* have historical, architectural and sociocultural values, and whilst strategies did not value social values, material cultural values were generally considered and preserved, contributing to the enhancement of intangible values. The implications of this theory-based and evidence-based research highlight the importance of evaluating actual effects for cultural heritage theory, architectural conservation practice and heritage management policy.

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Abbreviations, Acronyms and Note on Terminology

ANTT:	National Archives of Torre do Tombo
AML:	Lisbon Municipality Archive
CoE:	Council of Europe
CPF:	Portuguese Centre of Photography
DGEMN:	General-Directorate for National Buildings and Monuments
DGPC:	General-Directorate of Cultural Heritage
DRCA:	Regional-Directorate of Culture of <i>Alentejo</i>
EIB:	European Investment Bank
EH:	English Heritage
EIA:	Environmental Impact Assessment
FCT:	Calouste Gulbenkian Foundation
FMS:	<i>Fundação Marques da Silva</i>
GCI:	Getty Conservation Institute
HLF:	Heritage Lottery Fund
ICOMOS:	International Council of Monuments and Sites
ICT:	Information and Communication Technologies
IGAPHE:	Institute for the Management and Disposal of State-Owned Housing
IGESPAR:	Management Institute of Architectural and Archaeological Heritage
IHRU:	Institute for Housing and Urban Rehabilitation,
INH:	National Housing Institute
IPPAR:	Portuguese Institute of Architectural and Archaeological Heritage (1992-2007)
IPPC:	Portuguese Institute of Cultural Heritage (1980-1992)
MIP-JAEES:	Ministry of Public Instruction - Board of Adm. of the Loan for Secondary Education
JCETS-MOP:	Ministry of Public Works - Building Board for Technical and Secondary Education
OECD/CELE:	Org. for Economic Co-operation Development/Centre Effective Learning Environments
SIPA:	Heritage Information System
SMP:	(Secondary) Schools Modernization Programme
UNESCO:	United Nations Educational, Scientific and Cultural Organisation
WHS:	World Heritage Site

Note: Throughout the dissertation, italics are used to mark non-English words, such as *liceus*, *Lycée*, *escaiola*, etc., and published materials/sources, such as *Venice Charter*. Quotation marks are used to indicate citations and concepts, such as 'cultural significance'.

1.1 Introduction

The main topic of this research is the significance of architectural heritage and the effect that rehabilitation interventions can have on cultural values. The effects of rehabilitation design decisions have been of great concern for conservation professionals for a long time, perhaps only officially acknowledged with the international adoption of the seminal *Athens Charter for the Restoration of Historic Monuments* (CIAM, 1931) at the First International Congress of Architects and Technicians of Historic Monuments. By recognising that conservation project evaluation aims 'to prevent mistakes' (resolution 2), these professionals were expressing their concern for the impacts that their own conservation decisions could have on monuments' 'character and historical values'. Moreover, as historic monuments greatly express civilisation, their protection through conservation was considered to be 'one that interests the community of the states, which are wardens of civilisation' (CIAM, 1931). Therefore, not only are governments called on to protect and preserve heritage cultural values in the present, for the benefits of future generations, the charter further stresses the importance of education with regard to monuments, as respect and attachment of the peoples themselves are 'the best guarantee in the matter of the preservation of monuments and works of art' (Conclusion VIIb). The relevance of this apparently old document relies on its contemporaneity as today the sustainability of architectural heritage still relies on governments' management actions and in peoples' esteem and relationships.

The passage of time has been justifying these ideas. Following a traditional approach, management guidelines have firstly been issued to provide criteria for the preservation of cultural material values in conservation interventions, and more recently emphasis has been given to participation and acknowledgment of people's feelings for and perceptions of architectural heritage. The evaluation of conservation projects has also gained support through tools to assess the predicted impact of interventions on heritage cultural values. However, at the beginning of the twenty-first century, the 'prevention of mistakes' has not yet been followed by a post-conservation evaluation practice to assess if mistakes concerning the 'character and historical values' have in effect been avoided.

This thesis discusses the currently available evaluation tools for heritage conservation, demonstrates the lack of a tool that effectively addresses this problem, designs such a tool and tests it by evaluating the results of conservation practice design decisions on cultural values. Therefore, this chapter firstly outlines the research rationale and background (section 1.2), followed by the research aim and objectives (section 1.3). A summary of the research design (section 1.4) is then followed by a discussion of the significance and justification of the research (section 1.5). Finally, section 1.6 outlines the remaining thesis structure.

1.2 Rationale and Research Background

School architecture has been identified as a building typology in the literature since the late nineteenth century (Burke and Grosvenor, 2008, Markus, 1993, Robson, 1877), and has encompassed a varied educational curriculum showcasing diverse architectural expressions, styles, construction techniques and materials, reflecting a range of design contexts and construction periods (Becker, Tostões and Wang, 1998, Pevsner, 1976, Alegre, 2009, Moniz, 2004, Beja et al., 1990). Some of these buildings for education now form part of our architectural heritage due to their historic and aesthetic values (Mestre and Aleixo, 2011b, Déom, 2008, Barata and Botas, 2003, Harwood, 2010, Alegre, 2012a, Burke and Grosvenor, 2008). Their significance in terms of educational heritage calls for their careful preservation and safeguarding. This is generally echoed in contemporary architectural conservation recommendations (ICOMOS, 1964, ICOMOS New Zealand, 1992, UNESCO, 1972a, Council of Europe, 1985a, Council of Europe, 1991, Council of Europe, 1994, UNESCO, 2004). However, educational space and functional requirements have changed over time and are now in need of attention, requiring contemporary design to cater for physical, functional and environmental changes in the creation of new facilities (Gislason, 2010, Lackney, 2001, Nair and Fielding, 2005, Building Futures, 2004, Dudek, 2000, Tanner and Lackney, 2006) and/ or in the design for rehabilitation, reuse and extension of historic schools (21st Century School Fund, 2001, Beaumont and Pianca, 2002, Beaumont, 2003, English Heritage and DfES, 2005, CEFPI, 2005).

The reason for such recent and widespread interest in school architecture arises from a diverse range of public reforms in the educational sector. Education reforms introduced a new understanding of education at the beginning of the twenty-first century, particularly in

secondary education. These reforms took place simultaneously worldwide, and a new education paradigm brought several implications for education facilities (Jamieson et al., 2000, CEFPI, 2005, Lawson, 2000, Building Futures, 2004). For example, one of the implications of raising the school leaving age was the need for more and larger facilities. However, one of the most important drivers for change was a shift in the teaching-learning process, moving the focus away from the traditional classroom to the wider school environment, which requires changes to existing school spaces and equipment (Heitor, 2009). Various motives underlie this shift, with the chief driver of this change appearing to be the speed with which technological innovation has been changing our way of life. Having access to virtual information and having access to it everywhere has made the physical school environment seem redundant because information is no longer limited to the physical space (Australian Learning and Teaching Council, 2009). As a result, schools, as physical entities, are now required to provide stimulating environments, adequate equipment, environmentally friendly atmospheres and new amenities that promote higher enrolment numbers and capture students' enthusiasm for learning (Dudek, 2000, OECD, 2006, Nair, 2001).

The need to recognise schools as multi-purpose learning centres opened to local communities, and the importance of sustainable school management with a view to expanding compulsory education to better prepare young people for twenty-first century challenges, were emphasised by the European Union Lisbon Summit's (2000) *'Modernising School Education'* agenda. Concurrently, rapidly advancing global warming and the need to provide sustainable environments with reduced greenhouse gas emissions emphasise the case for existing buildings to be adapted and their embodied energy preserved (United Nations, 1992, CABE, 2005, Wood, 2006, Orbaşlı, 2008, Mansfield, 2011).

These sustainability indicators prompted several government initiatives aiming to provide new learning environments in old school buildings, for example, in England, in Australia, in the USA, and in Scotland (The Scottish Government, 2007, Hylton, 2007, Royal Australian Institute of Architects, 2004, English Heritage, 2010). The momentum arising from a shared international interest in the topic provides an opportunity to learn through exchanges of information and best practice. Several governments have adopted new legislation on education and on the educational environment; independent institutions have been established; and education ministries have been leading national modernisation programmes to facilitate the management of schools' physical networks and of government investment programmes. Examples of secondary school buildings' programmes arising from these measures are Building Schools for the Future (BSF) in England (2005-2010), overseen by Partnerships for Schools

(PfS), and the Portuguese Schools Modernization Programme (SMP), under the responsibility of Parque Escolar EPE (2007-ongoing). Although BSF contained no particular guidance for the preservation of existing buildings, in SMP it formed one of the requirements of the international investment programme, providing an opportunity for the commissioning of several rehabilitation projects. The conservation of historic buildings and the design of schools have been, for the first time in Portugal, considered simultaneously in architectural practice on a national scale.

Worldwide academic and professional interest in the rehabilitation of public school buildings gained momentum at the beginning of the twenty-first century, contributing to the traditional conceptualisation of schools as an architectural typology (Martin, 1952, Seaborne and Lowe, 1977, Dudek, 2000, Burke and Grosvenor, 2008, Robson, 1972 (1874), Clark and Seabourne, 1995, Harwood, 2010, Barnard, 1854) and creating a new conceptual approach, considering schools as learning environments, which affect users' performance, namely their academic achievements (OECD, 2009, Clark, 2002, Schneider, 2002, Al, Odaci and Sagsöz, 2011, Higgins et al., 2005).

A large number of publications in education and architecture journals (Al, Odaci and Sagsöz, 2011, Chiles, 2003, Clark, 2002), architecture magazines, books and monographs have increased the dissemination of information on historic school adaptations to contemporary education needs, drawing on examples of best practice (Harwood, 2010, Hertzberger, 2009, Mestre and Aleixo, 2011a). Evidence of growing public awareness of these issues is found in newspaper articles referencing public opinion on the refurbishment of former schools in different national contexts. Simultaneously, a significant increase in the amount of grey literature (Lawrence et al., 2014) on the topic, such as reports, conference proceedings and official documents not published commercially or scholarly, have been produced by institutions, non-governmental organisations and governments in a number of countries, but especially within the UK (for e.g. CABE, 2009, CABE, 2010, CABE, 2006, English Heritage, 2010, English Heritage, 2005, English Heritage, 2007, English Heritage, 2011b, English Heritage and DfES, 2005, MORI, 2003, PricewaterhouseCoopers, 2008, 4Ps and PfS, 2007), providing a rich group of resources for public policy and practice engagement. There is, however, a significant lack of research regarding the impact of rehabilitation processes on the recognised cultural and social values of historic school buildings.

The need to conserve buildings, whether schools or other types of buildings, arises from a change in the physical fabric of a building and/or its usage requirements (Brand, 1997). The

heritage conservation literature evidences that buildings are conserved for reasons beyond the physical, stressing the importance of cultural values, including the aesthetic, historic, scientific, social or spiritual aspects (Avrami, Mason and de la Torre, 2000, Orbaşlı, 2008, ICOMOS Australia, 2013). Methodologically, a values-based approach to architectural conservation requires objectivity in the assessment of values (Orbaşlı, 2008, Mason, 2002, UNESCO, 1972a), which has led to a hegemony of expert assessments of such projects, with the shortcoming of producing subjective assessments with a disproportionate focus on physical aspects. However, this method of identifying the significance of historic buildings is currently undergoing a theoretical shift aimed at maintaining and transmitting value-specific characteristics of cultural heritage to future generations (Council of Europe, 2005).

Considering that the aim of architecture, and inherently of architectural conservation, is to provide healthy, safe and aesthetically pleasing environments, which are suitable for a specific use and which meet the living standards of contemporary life, it is vital to know people's expectations, ambitions and needs in the process of architectural conservation. Furthermore, when such processes are to take place within a historic building, the aim of conservation is to retain the place's cultural significance 'as reliable evidence of the past' (Article 2 in ICOMOS, 2002). Heritage's cultural significance, considering its tangible values such as townscape, landscape and architectural values (UNESCO, 1972a) and intangible values such as meanings and associations (UNESCO, 2003), needs to be acknowledged so such buildings can be preserved. Intangible values rely on meanings and associations established between individuals and places, making public participation essential. Besides research to establish the heritage place historic values, a holistic establishment of values requires the involvement of users and other stakeholders, whether this is in the construction of a new building or in the adaptation of an existing one, particularly in the case of school buildings (Sanoff, 1978, Sanoff, 2008, Walden, 2009, Lackney, 2011).

To date, community participation in Portugal does not appear to have been applied in architectural conservation practice. Evidence from practice, personal and observed, suggests that the decision-making process in conservation interventions still very much follows traditional pathways, whereby the architect plays the major role in assessing a place's significance, relying on an individual methodology and ethics, as no guidance is set out to guide the assessment. This perception of the architect being left alone in the 'evaluation of the importance of the elements involved' (Article 11 in ICOMOS, 1964) in architectural conservation interventions points to a discrepancy between theory and practice.

The importance of this issue is further emphasised by the recent Faro Framework Convention on the Value of Cultural Heritage for Society (Council of Europe, 2005) which ‘put[s] people and human values at the centre of an enlarged cross-disciplinary concept of cultural heritage’, recognising that the holistic understanding of cultural values involved in changes of the historic environment is a non-negotiable requirement if respect for the integrity of cultural heritage and its sustainable use are to be guaranteed. As a result, an understanding of the role of cultural values in architectural conservation processes and its outcomes requires an assessment of current practice.

1.2.1. A Practitioner View in the Portuguese Context

As a practitioner-architect, the researcher-architect was influenced by her experience in conservation practice for more than two decades. However, it was participation in the Schools Modernization Programme (SMP) in Portugal that triggered her interest in conducting the present research and sustained her motivation throughout the study. This programme aimed to modernise 332 secondary schools by 2015 (Heitor et al., 2009), of a total of 477 schools built from the end of the nineteenth-century onwards (Heitor, 2008a, p. 28), including *liceus* buildings – a typology designed until 1974 for secondary education (academy-type schools).

Portuguese Educational Architecture has been recognised in architecture monographs on twentieth-century production (Ordem dos Arquitectos, 2006, Tostões, 1995, Becker, Tostões and Wang, 1998, Tostões, 2004a). Beside the studies conducted on primary schools built until the 1970s (Beja et al., 1990, Beja et al., 1996), one of the most recent studies focused on the *liceu* building in Portugal from 1882 to 1978 (Alegre, 2012a), and previous to this research, historians of Education had already investigated the development of *liceus* through the study of their history, archives and memories, focusing on those built in the first half of the twentieth-century (Marques, 2003, Manique da Silva, 2002, Nóvoa and Santa-Clara, 2003). The importance of historic *liceus* is therefore undeniable.

Consequently, receiving an invitation to rehabilitate the oldest *liceu* in the country was considered an honour, as the client (representing the Ministry of Education), was publicly recognising the quality of our past work. However, it also felt like an enormous responsibility; firstly, towards present and future generations of students, staff and teachers, who aspire to a comfortable and pleasant environment; secondly towards past generations, the architects who designed the buildings and those who commissioned and built them, and the thousands of users who have learned, supervised and taught there, the memories of which are a cultural

value to be preserved; and thirdly considering urban, architecture, engineering and education history to which the office was being ethically committed to respect and to give continuity in time and place. Finally, it was a responsibility to the local community, for which the historic *liceu* was a feature symbolically standing for education, an esteemed value, and which demanded attention in terms of its observable physical conditions so that a prestigious image could return to the public realm.

After this invitation, the office was commissioned to rehabilitate another *liceu*, originally designed 40 years later, in which the historic value was officially not recognised by the government as no proposal for listing existed, presumably because it belonged to the dictatorship period (1933-1974) – a style well expressed in the public buildings architecture all over the country. However, the ethical commitment and the other responsibilities were felt to be equally important here as, regardless of the more recent historic values, it preserved the same socio-cultural values and was one in a small group of 13 *liceus* designed and built before 1950. Finally, the last commission was to intervene in a pavilion-type school built in the 1990s, where the historic value was not an issue, and the school belonged to a group of building-types, which stand for 77% of secondary school building stock, all built after 1970 (Heitor, 2008a, p. 28). Again, the ethical position was the same with the same responsibility felt towards the socio-cultural values involved. In summary, considering that the level of ethical consciousness is the same, architectural design strategies were established differently, according to each case. Reflecting on these issues, a question was raised: when establishing rehabilitation design strategies for the interventions in historic buildings, which design principles were most used: architectural school design or architectural conservation design principles? Or both? Which guidance was most used in the establishment of design strategies? Was there a cultural values-based approach in rehabilitation design?

After this period of annual commissions, as the works were being finished, an appropriation by the users was taking place. It was then felt that if participation had been a real objective, as disseminated, two results could have been found: some 'mistakes' (CIAM, 1931) could have been avoided and the heritage awareness would have been increased (*idem*). Therefore, what mistakes could have been avoided? Were there 'character and historical values' (*idem*) ascribed by school users that were lost? After all, what did users value in their historic work environment? What do they value now, after rehabilitation? What degree of heritage awareness had the users of historic schools about their working environment? These questions posed by a novice architect-researcher required reflective thinking not just on architectural

research but within empirical social research – a new field of academic knowledge for the researcher, aware of its importance in rehabilitation processes.

The practitioner's interest in understanding more about 'reflective practice' lead her to discover Schön's Model (Schön, 1983), as had already occurred with practitioners in the UK, at the RIBA Research Symposium (Short, 2008). In this model, reflection on the knowledge gained by practice experience, for example in SMP, is contrasted with theoretical ideas, in this case, disseminated in conservation guidance documents. What was happening was that practice demonstrated that theoretical assumptions, for example about users' participation, were not in place in the conservation processes, which followed a traditional approach to establishing a diagnosis for problems found, such as material anomalies, services obsolescence and functional-spatial inadequacy. However, the academic research presented here does not aim to report on a personal perspective but rather to establish and support an argument through comparing and contrasting methods.

Therefore, and considering that it is important for a practitioner to address theory, to learn from others' experiences, and to return the produced knowledge to theory and to practice, this research was set out to develop an assessment tool that would account for the inherent effects of design strategies on the sustainability of historic buildings significance.

1.2.2. A Researcher View from an International Context

The decision was made to conduct this research in England, away from the cultural Portuguese context, in order to study the topic from an international perspective, especially as the previous/contemporary experience (at the time the only one known) of rehabilitation of historic schools, the Building Schools for the Future (BSF) programme, was considered a good precedent by Parque Escolar (PE), the company in charge of the management of the SMP. Design and assessment tools have been set out in the UK by English Heritage, CABE and PFS among others, which consider the historic and cultural significance of these places. Other countries were found to be conducting rehabilitation interventions in historic schools too, such as Canada, Australia and the USA, and disseminating their design principles, guidelines and strategies. Access to this previous knowledge was considered an opportunity for the researcher to conduct this study from the perspective of an international context.

The study of interventions which recently occurred in Portuguese secondary schools under SMP was found to be very stimulating, promising and rewarding: stimulating because of the intensity and variety of buildings and architects working simultaneously from North to South

towards the same objective of to enhancing past educational environments for the benefit of present and future generations; promising due to the researchers' personal interest in providing her daughter with a promising new learning environment, adapted to twenty-first-century education requirements; and finally, rewarding due to the opportunity to participate in this initiative. This opportunity to make a difference to the lives of around 1,500 users of this facility per day, and the responsibility to preserve historic *liceus* for future generations, made reflection an imperative; lessons needed to be learnt and the new knowledge acquired needed to be useful.

The context of returning to study for a research degree is linked to the feeling that I am now able to ask the questions that have wider implications within architectural conservation, and better understand participants' answers. I can now challenge accepted views and reflect on my own assumptions, developing my professional knowledge, learning new skills and enhance my ability of 'reflective thinking' (Powell, 2008, p. 161)

The development of the tool was influenced by the fact that the researcher is a practitioner. The interpretivist approach used in rehabilitation practice was initially brought to the research. This position believes that one cannot separate oneself from what one knows, and therefore, the researchers' values are inherent in all phases of the research process, using previous knowledge to generate new knowledge. The particular research context and time, i.e., the reality, is the result of specific cultural and social settings, constructed through the meanings and understandings developed socially and experientially, for which the researcher seeks experiences, understandings and perceptions of individuals. The development of the research took a constructivist approach to reality, designing a qualitative approach to determine and evaluate cultural values. Naturalistic methods, such as interviewing, observation and analysis of existing texts, were designed to understand the reality, while practical experience helped in identifying the variables most useful for practitioners. Therefore, the review of the literature in conjunction with previous practice changed the researcher/architect's previous perspective on heritage cultural significance during the research process.

By describing my past practice experience, which continued while conducting this research, the reader is provided with background information so that the setting, the participants, and particularly my perspective and interpretation (Creswell, 2009) of architectural conservation effects on historic *liceus* cultural values can be better understood.

1.3 Research Aim and Objectives

The main topic of this research is the significance of architectural heritage and the effect that rehabilitation interventions can have on cultural values. This thesis argues that architectural rehabilitation may contribute to the sustainability of the cultural significance of architectural heritage by preserving and enhancing cultural values while updating historic settings, buildings and contents to respond to contemporary socio-cultural values and to ensure that they are fit for use in the twenty-first century. Then, effects of physical change may contribute to enhance a sense of place, of continuity and of a community, which are key for the sustainability of architectural heritage cultural values. Therefore, the overall aim of the research is to study the contribution which architectural rehabilitation design has made towards sustaining and contributing to cultural significance, focusing on historic school buildings in Portugal. To meet this aim, the following research objectives have been established:

Research Objective 1. To establish a theoretical framework on cultural significance of a place, rehabilitation design strategies and cultural significance change from a review of the literature;

Research Objective 2. To design a tool for architectural heritage rehabilitation practice which evaluates design effects on cultural significance;

Research Objective 3. To test the tool in rehabilitated historic *liceus* in Portugal

Research Objective 4. To draw conclusions on the effectiveness of the tool in identifying rehabilitation short-term effects on cultural significance.

1.4 Research Design

To clearly illustrate how the research planned to answer the established research objectives, Figure 1.1 below displays the interconnection of the three research components of a qualitative approach, adopted in the design of this research: philosophical worldviews, strategies of inquiry, and research methods (Creswell, 2009).



Figure 1.1. Research Design Framework, adapted from Creswell (2009, p. 5).

The philosophical approach of the research is supported by two theories: constructivist and interpretivist. In a constructivist approach, the researcher aims 'to rely as much as possible on the participant's views of the situation being studied' (Creswell, 2009, p. 8), and therefore is interested in understanding their description of events and of the cultural settings. It is the researcher's intent to 'make sense (or interpret) the meanings others have about the world' (idem, p. 8), for which an interpretivist analysis assume that individuals seek to understand the reality around them by attributing meanings to objects and things (idem, p.5), and therefore, meanings are the result of the context of each one's lives. As social concepts that arise from interaction within a community (Creswell, 2009), meanings and values are shaped by culture, history and social issues and therefore, the context of participants must be understood by visiting the places and gathering personal information (Creswell, 2009).

This approach leads to a qualitative strategy of inquiry, supported by multiple case studies enabling the researcher to explore the topic of cultural values in depth (Creswell, 2009, Walliman, 2011, Yin, 2009). Case studies are bounded by time and activity, for which a variety of data collection procedures can be applied over a period of time. The inductive process of qualitative research to gather data on cultural heritage values required data collection tools to include open-ended questions so it can allow participants to interpret and ascribe meanings to places and events, and subsequently enable the researcher to conduct interpretive analysis to

generate new meaning(s) from data collected in the field. Case studies strategies, such as within-case data analysis and cross-case data analysis validated evidence gathered from different sources (Miles and Huberman, 1994). For example, the 'case studies timeline' synthesised data on the original and development of historic *liceus*, identifying unique patterns of each case and enabling cross comparison. Cross-case analysis used two cases from each significant period to identify similarities and differences, and finally, a triangulation approach to the data enabled the correlation of results.

The case studies were selected to provide a national scope and a combination of sources were used to gather a variety of data from each of the six selected cases. The scope and variety of data is summarised in the table below, as well as the analysis methods applied, including the preliminary data analysis strategies used – the summary techniques Contact Record Form and Case Summary Forms (Miles and Huberman, 1994) (see Table 1.1).

Categories of Cultural Heritage Values	Sources	Gathering tools	Reduction tools	Analysis
Embedded /Documented	original design documents photographs site	observation notes site survey observation notes/memos photographs	analytical drawings notes	Case Summary Form per case Content/Thematic Comparative Analysis
Used/Instrumental	decision-makers of rehabilitation process: owner (PE) architects (ARCH)	Semi-structured interview	transcripts	Contact Summary Form per participants group Content/Thematic Comparative Analysis Narrative Analysis
Ascribed/Experienced	targeted stakeholders groups: students 7 th (A7) students 12 th (A12) staff(F) teachers(D) school director (SD)	acrostic questionnaire semi-structured interview	wordclouds tables graphics transcripts	Contact Record Form per case Content/Thematic Comparative Analysis
Recognised/Documented	heritage records original design documents published literature	notes	tables	Contact Record Form per case Content/Thematic Comparative Analysis

Table 1.1. Research Methods: data scope and the variety of sources.

Generally, the present study consisted of three phases: desk-based research based on documents analysis; empirical research conducted in six historic *liceus* in Portugal, which have been recently, and simultaneously, rehabilitated under the same education objectives; and finally desk-based analysis and reflection on the findings, in which the present thesis writing was finalised. Reviewing the literature identified key concepts, debates, problems and gaps in

knowledge regarding the understanding of the design strategies of architectural conservation and their effects on historic buildings' cultural significance. The literature review guided the development of a preliminary conceptual framework from which to address change in cultural significance as the result of architectural conservation (Weiss, 1995). Research previously conducted on this topic indicated the adoption of qualitative architectural research with a focus on the interpretation and meanings of empirical data (Groat and Wang, 2002). A case study strategy (Yin, 2009, Walliman, 2005) is adopted in this research using purposive sampling (Groat and Wang, 2002, Walliman, 2005). The main sources of the primary data are two main groups of stakeholders, decision-makers and users, and selected historic school buildings which are at a post-rehabilitation stage. The collection of retrospective data (Jupp, 2006), which could be understood as a limitation of the research, enabled the participants to have a benchmark when judging and evaluating changes, hence it is in this case considered a strength of the research.

Secondary data, including public records, design guidelines and the architectural project documentation provided contextual data and was interrogated through thematic analysis (Patton, 2002, Saldaña, 2009). Based on research methods applied in the built environment in architectural research and in cultural heritage studies, specific research tools were developed to fulfil the research objectives. Interviews (Groat and Wang, 2002, Mason, 2003) were conducted with decision-makers, and questionnaires (Oppenheim, 2006) and acrostic poems (Sanoff, 2001, Kishore, 2011) were designed to gather data from selected groups of users: teachers, staff and students. Site surveys enabled the observation of the physical environment after the interventions. Content analysis (Walliman, 2005) and narrative analysis (Chase, 2011, Michael Boje, 2009, Psarra, 2009) guided an interpretivist approach (Berg, 2009, Knight and Ruddock, 2008, Walliman, 2005) which considered the emic perspective of participants to historic *liceus* values, and the ethical approach to the analysis of material cultural evidence conducted by the researcher, from a researcher-practitioner perspective. Punch (2014) considers that in this approach, an insider can become an outsider, and this is the role taken by the researcher: a previous insider now in the position of an informed outsider.

1.5 Significance and Justification of the Research

As explained, Portuguese historic *liceus* were selected because of the researcher's familiarity with the rehabilitation programme and with its practice. The current research is timely and relevant as it draws conclusions that can contribute to the government's efforts to conserve architectural heritage and to support the aims of enhancing the awareness of the value of cultural heritage for society, as suggested by the *Faro Framework Convention*, recently in force in Portugal (Council of Europe, 2005). The identification of categories of values relevant for the establishment of historic schools significance is important for the preservation of distinctive and representative features of the period of the design of these facilities, which reflect political, educational, economic, architectural, technological and social features of the historic period. Besides establishing categories for the identification of past values, the tool proposed in this research stresses individuals' and communities' associations with historic places, which contribute to their wellbeing, fostering a sense of community, continuity and attachment.

The tool is primarily useful in monitoring intervention results in the long term, providing benchmarks to identify the nature of change and degree of success of interventions in cases where the benefit aimed at is not economic, therefore not measured by existing tools.

The opportunity afforded by this study was stressed by two newspaper articles. In 2009, the institute formerly known as IGESPAR – now the Directorate-General for Cultural Heritage (DGPC) – expressed its fear for the possible 'disappearance of school architecture' as interventions at the time '[would] not allow the preservation of the characteristic attributes of these schools' (Viana, 2009), adding that in three cases the application process arrived only after the construction had started. Beside concerns on the proposals' importance for cultural heritage values, later, an interview given by the Secretary of State for Culture identified the problem of unknown effects: 'There can be no state support for culture without evaluating the results' (Crespo, 2013). In cases such as public schools, where the results cannot be measured economically, other types of results are needed to support government policies. In the case of public architectural heritage, research based on knowledge of cultural values from users, decision-makers and architects is key to promote conservation sustainability.

1.6 Thesis Structure

The thesis is organised into nine chapters. The thesis structure reflects the methodological structure of the research, with the chapter sequence tracing the chronology of the study (see Table 1.2).

	N.o	Chapter Title	Objectives addressed
Research Methodology	Ch.01	Introduction	
Literature review	Ch.02	Cultural Values and Architectural Heritage Significance	1
	Ch.03	Establishing Change: The Cultural Process of Architectural Rehabilitation	1
	Ch.04	Portuguese Historic Schools <i>Liceus</i> and the Rehabilitation Context	1
Evaluation Tool	Ch.05	Designing and Operationalizing an Evaluation Tool	2
Test of the Evaluation Tool and Reflection	Ch.06	Establishing the Values of Historic Liceus in the Early Twenty-First Century	3A
	Ch.07	Rehabilitation Design Principles and Strategies: the Role of Cultural Values	3B
	Ch.08	Short-term Effects of Rehabilitation on the Cultural Values of Historic <i>Liceus</i>	3C
Research Findings and Conclusions	Ch.09	Conclusion	4

Table 1.2. Structure of the thesis

This introductory chapter provides a general background and describes the current situation of Portuguese *liceus*. It also identifies a gap in the knowledge, outlines the research aim and objectives and explains the research structure. The subsequent three chapters address the literature review, providing a framework for the research on the relationship between significance, rehabilitation, and evaluation of change. The theoretical background of the study's key concepts is outlined through a critical evaluation of published research and scholar articles.

Specifically, Chapter Two defines the terms ‘cultural significance’, ‘cultural heritage’ and ‘cultural sustainability’ as they are used throughout the thesis. Furthermore, the chapter identifies relevant cultural values based on architectural heritage literature.

Chapter Three examines current theories on conservation, focused on rehabilitation as a tool for change, and how design principles can affect cultural values. It also discusses the available tools to assess the significance and evaluate change in order to inform the establishment of an evaluation tool for the rehabilitation design process.

Chapter Four introduces the historic Portuguese schools known as *liceus* and the national programme for their modernisation. Together, Chapters Two, Three and Four address the first research objective: establishing a framework to guide the development of a tool (see Chapter Five) for the collection and analysis of empirical data from the case-studies (see Chapters Six, Seven and Eight).

Chapter Five develops an assessment tool for the Evaluation of Rehabilitation Effects on Cultural Significance (ERECS), and discusses the predominantly qualitative approach, the general case study strategy, and the research methods designed for data collection. It also explains the techniques used to analyse the data.

The next three chapters address the third research objective: to test the tool, discussing the findings of the empirical research in each case, data collected through observation, questionnaires and semi-structured interviews is displayed, analysed and summarised. The chapters are presented according to the designed stages of the tool – inputs, design process and outputs/outcomes – in relation to the cultural values framework for rehabilitation change evaluation, and address the effectiveness of the tool in each stage.

Chapter Six introduces the case studies, firstly focusing on their historic values. The architectural analysis of historic *liceus* as they have reached the twenty-first-century is complemented by the retrospective insights of users’ perceptions of the cultural significance of historic *liceus* before interventions, informed by national heritage listing documents.

The rehabilitation design strategies are examined in Chapter Seven through architectural analysis of the design proposals and decision-makers’ descriptions of the design process, thereby identifying the role which cultural values played in the design strategies and the role of heritage appraisals.

Chapter Eight again focuses on cultural significance in order to assess the actual physical results of rehabilitation interventions in historic schools, and its effects on users’ senses of

place, continuity and community, thereby concluding the objectives of research objective three.

Chapter Nine is the final chapter, which brings together the findings discussed in the thesis and provide specific answers to the main research question. Recommendations to contribute to improving the sustainability of Portuguese historic *liceus*, and therefore Portuguese educational architecture heritage, are listed. This chapter also draws conclusions regarding the optimum conservation design strategies for the sustainability of cultural significance. Concluding the chapter, the contribution of the research to knowledge is explained and recommendations for further work are identified.

Chapter Two. Cultural Values and Architectural Heritage Significance

2.1 Introduction

This chapter will explore key concepts and definitions of 'culture', 'architectural heritage' as 'material cultural heritage', and 'cultural significance', with a view to examining the relevant literature on the theoretical assumption that a building's importance relies on the values ascribed to architectural qualities, which create worth to local communities, to a nation or to society. Cultural values are regarded as important for past, present and future generations. Thus, any conceptualisation of 'significance' requires the understanding of recognition of past and current values. The research scope was delineated through two paths of investigation: a comprehensive literature survey of criteria and indicators relevant for the assessment of sustainability of cultural significance, and their ability to address the range of architectural heritage values.

2.2 Cultural Approaches to Architectural Heritage

This section reviews the concepts and definitions of architecture, heritage and significance associated with architectural design as a cultural action from which material cultural objects are built, and to which immaterial values are attached.

2.2.1 Culture and Architecture

The definition of the concept of 'culture' is extremely complex (Spencer-Oatey, 2012, UCLG, 2009). Turning to the Oxford English Dictionary (OED), two main definitions were found under the adjective 'cultural', which relates to intellectual and artistic pursuits, for example the culture of a particular society, people, or period, or to the philosophy, practices, and attitudes of a business or an institution. When applying the concept to architecture, these two different perspectives refer to the result of the cultural context in which the buildings are designed and built, i.e., as the product of intellectual and artistic actions, and the result of such actions as a

cultural artefact, such as an architect's original thought expressed in drawings and ultimately in buildings, reflecting the contextual framework at the period of creation, therefore expressing a cultural moment.

In cultural anthropology, Haviland has defined 'culture' as 'abstract values, beliefs and perceptions of the world that lie behind people's behaviour and that are reflected in their behaviour' (Haviland, 2002, p. 33), adding that these values are socially shared, therefore culturally translated into people's common behaviours. However, to date, the anthropologists Kroeber and Kluckhohn's 1952 review of 164 definitions in cultural theory studies still provides the most commonly used definition:

'Culture consists of patterns, explicit and implicit, of and for behaviour acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiment in artifacts; the essential core of culture consists of traditional (i.e. historically derived and selected) ideas and especially their attached values; culture systems may, on the one hand, be considered as products of action, on the other, as conditional elements of future action' (Kroeber and Kluckhohn, 1952, p. 181).

Following this definition of 'culture', additional significant interpretations can be applied to the context of architecture. First among these is the idea of culture as explicit patterns of architects' behaviour, as knowledge applied in design approaches aimed to answer social problems, reflecting the temporal and socio-cultural context of the design and the architect's own culture, and ultimately embedded as cultural values in both the design proposals and in the design product, the buildings, themselves. Secondly, through the understanding of culture as implicit patterns that result from design, and the physical spaces that shape the cultural behaviour of its users, architectural design establishes how space should be used. This facilitates sensorial experiences that suggest perceptions, attitudes and behaviours, which ultimately inform a shared cultural valuation of the place, recognising its particular cultural context. As a result, buildings are material cultural products that result from the cultural act of designing architecture, and these same buildings define the immaterial cultural values of these spaces. Or converting this rationale into 1943 Winston Churchill's words: 'We shape our buildings and afterwards our buildings shape us' (cited in Brand, 1997, p. 3). Therefore, buildings are a tool to develop culture.

This approach to architecture as the result of a cultural action results in a built form in which the cultural expression of society is reflected, and further provides cultural experiences to its users, all of which signifies architecture as a holistic cultural resource. The passage of time adds further historic value to buildings as they become evidence of past events. At this stage, where an historical distance separates the original design from the moment of value

judgement, cultural awareness is required to fully appreciate the significance of these buildings.

Cultural awareness of the essence of architecture and its processes of creating artistic and technical responses to social problems enables an understanding and interpretation of architecture's temporal and contextual abstract ideas as embedded in historic buildings. These might concern values related to aesthetic, functional, comfort, health or security concerns. On the other hand, cultural awareness of the essence of a place's uses provide communities with a sense of identity and contributes to the social and cultural development of societies. As each individual is part of a nation, a region, a specific generation, a social and occupational level, different characteristics and different life experiences result in the recognition of different layers of culture for different individuals or groups. Cultural approaches to architecture are thus essential for understanding the built heritage.

2.2.2 Cultural Heritage, Historic Values

To better understand the concept of 'cultural heritage', the Oxford English Dictionary considers 'heritage' to be 'that which has been or may be inherited'. Accordingly, the word 'patrimony', still in use particularly in Mediterranean countries, derives from the Latin word *pater*, which means 'father', and means 'property inherited from one's father or passed down from one's ancestors; an inheritance'. Heritage and patrimony therefore refer to inheritance as something that has an inherited age value. It is further noteworthy that the first definition does not refer to personal possession, nor to the materiality or immateriality of the 'inherited', which is intrinsic in the latter. Both definitions refer to the past as the provider, and the present as the receiver, without referring to the future.

However, the origin of 'heritage' as a concept is rooted in the legal definition of 'things which can be passed from one generation to the next and following generations, and to which descendants of the original owner(s) have rights deemed worthy of respect' (Pearce, 2000, p. 59). This definition refers to the materiality of 'things' without mention of the affection and meanings that 'things' can induce in people, other than respect, and the importance of such meanings in their preservation. Nevertheless, the author argues that the separation of ideas and feelings from property is not possible because 'no social idea can exist without its physical manifestation' (idem, p. 59) and therefore, the author argues, material heritage triggers immaterial values.

As a concept, 'cultural heritage' was first defined at the Convention on the Protection of the World Cultural and Natural Heritage (WHC) (UNESCO, 1972a), aiming to raise states' awareness of the need to identify, protect, conserve, present and transmit to future generations the cultural and natural heritage'.¹ It establishes 'cultural heritage' as including monuments, groups of buildings and sites, defining 'monuments' in its article 1, as:

'architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art or science.'

Complementing this document, the Recommendation Concerning the Protection, at National Level, of the Cultural and Natural Heritage, further considers that cultural heritage 'constitute an essential feature of mankind's heritage and a source of enrichment and harmonious development for present and future civilization' (UNESCO, 1972b), stressing the need to sustain cultural heritage. For this purpose, State Parties are compelled 'to adopt a general policy which aims to give the cultural and natural heritage a function in the life of the community' (Article 5, paragraph (a) in UNESCO, 1972a).

Possibly, the most recent answer to the question 'What is meant by Cultural Heritage?' has been set out by ICOMOS:

Over time, the meaning of cultural heritage has expanded from single monuments identified as objects of art to cultural landscapes, historic cities, and serial properties. Moreover, contemporary practice (...) extends the concept of heritage beyond «tangible heritage», to the intangible dimensions of heritage as well. This means the entirety of the capital of knowledge derived from the development and experience of human practices, and from the spatial, social and cultural constructions linked to it that may be encapsulated in the word “memory” (ICOMOS, 2015, p. 4).

However, architectural heritage has been in severe danger in the twentieth century, particularly in Europe with the Second World War. This period of considerable destruction of monuments, buildings and cities has increased appreciation of the importance of heritage to individual and collective identity. With the aim to protect cultural heritage, international organisations were founded to establish legal systems and issue recommendations on the protection of the historic built environment.

2.2.3 Protecting Architectural Heritage

In 1946, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) was founded, issuing the *Convention for the Protection of Cultural Property in the Event of Armed Conflict* (UNESCO, 1954), and in 1972 the *Convention concerning the Protection of the World Cultural and Natural Heritage* (WHC) (UNESCO, 1972a). The International Council for

¹ Portugal ratified the convention in 1980 and is currently one of 189 states to have done so.

Monuments and Sites (ICOMOS), an international non-governmental body, was founded in 1965, as a result of the international adoption of the *Venice Charter* (ICOMOS, 1964), becoming UNESCO's main advisor in matters concerning the conservation and protection of monuments and sites. Furthermore, cultural heritage is also evident in European Conventions and Charters issued by the Council of Europe – an intergovernmental organisation. With the aim of promoting awareness and encouraging the development of Europe's cultural identity and diversity, they include the *Paris Convention* (Council of Europe, 1954) which highlighted the existing cultural diversity in Europe and urged for the importance of safeguarding and developing this common heritage, the European Charter of the Architectural Heritage, the Amsterdam Charter (Council of Europe, 1975), and the Convention for the Protection of the Architectural Heritage of Europe, the Granada Convention (Council of Europe, 1985a).

The document most widely recognised as a conservation document is the *Venice Charter* (ICOMOS, 1964) as it expands the concept of historic monument to include the setting 'in which is found the evidence of a particular civilization, a significant development or a historic event', highlighting that cultural significance is acquired, not intrinsic, and depends on the passage of time. Therefore, significance can be established through the aesthetic and historic values which reside in the monument and in its context. Finally, the charter considers that the assessment of values must not rely only in 'the individual in charge of the work' (ICOMOS, 1964), highlighting the collective responsibility in the definition of a monument's values. The *Amsterdam Charter*, published shortly after, stressed the evidential value of the past to contemporary life that architectural heritage embeds, and how irreplaceable values of architectural heritage are (Council of Europe, 1975). The term 'European architectural heritage' 'includes the groups of lesser buildings in our old towns and characteristic villages in their natural or manmade settings' (idem p. 1), shifting from the idea that had been in use since the end of the nineteenth century where only isolated historic monuments were considered important for purposes of protection and restoration. The individual 'character' of a building and the 'atmosphere' of its surroundings, are now understood as important elements that can contribute to an understanding of the role of the past in contemporary life.

The *Granada Convention* (Council of Europe, 1985a) established principles of integrated conservation as the consideration of spatial and urban planning, relationships between heritage protection and cultural activities, and the preservation of technical and traditional skills, further stressing the importance of handing down a system of cultural references to future generations. Architectural heritage is considered an element of cultural identity and comprise three types of properties:

1. Monuments: all buildings and structures of conspicuous historical, archaeological, artistic, scientific, social or technical interest, including their fixtures and fittings;
2. Groups of buildings: homogeneous groups of urban or rural buildings conspicuous for their historical, archaeological, artistic, scientific, social or technical interest which are sufficiently coherent to form topographically definable units;
3. Sites: the combined works of man and nature, being areas which are partially built upon and sufficiently distinctive and homogeneous to be topographically definable and are of conspicuous historical, archaeological, artistic, scientific, social or technical interest. (Council of Europe, 1985a, pp. 2-3)

When the *Vienna Memorandum* (UNESCO, 2005) addressed the sustainable development of urban landscapes of heritage significance, this idea of integrated approach was enlarged to include the careful insertion of contemporary architecture and consideration of its contribution to landscape integrity.

2.3 Cultural Significance: A Values-based Approach to Architectural Heritage

Following the establishment of cultural heritage, the research turns now to cultural significance. Dictionary definitions can help to clarify what 'significance' means. The OED considers it to be the quality of being worthy of attention, the importance of something, and its meaning. When this worth or quality is considered in relative terms, as measured by a standard of equivalence, the word 'value' is used to express esteem, admiration or quality for something useful for a specific purpose. Subsequently, the OED further considers 'value' to mean 'the principles or moral standards held by a person or social group' implying an individual or collective judgement, 'attributing merit or demerit to something according to certain standards or priorities'.

In the architectural heritage field, 'cultural significance' as a term was first used in the *Venice Charter* as the value given today to buildings with history which are important for a culture:

'The concept of a historic monument embraces not only the single architectural work but also the urban or rural setting in which is found the evidence of a particular civilization, a significant development or a historic event. This applies not only to great works of art but also to more modest works of the past which have acquired cultural significance with the passing of time' (Article 1 in ICOMOS, 1964)

In 1979 conservation principles in Australia were gathered in the first draft of the *Guidelines for the Conservation of Places of Cultural significance*, the Burra Charter (ICOMOS Australia, 1979), placing the idea of significance within the heart of the concept of heritage, defined as

meanings: 'Cultural significance means aesthetic, historic, scientific or social value for past, present or future generations' (ICOMOS Australia, 1979, p. 1). After decades of focusing on the conservation of the historic fabric, monuments and sites, the traditional approach to conservation based on experts' values observed a move towards a values-based approach (UNESCO et al., 2013). Subsequently, the 1988 revision is paradigmatic of the shift in the perception of the relevance of cultural significance for conservation of architectural heritage, by considering the need to retain significant uses, associations and meanings (Articles 7.1, 23 and 24), improving the focus on social value and therefore emphasising both the need for public participation (Article 12), and recognising the importance of heritage interpretation.

The 1999 version further broadens the definition into 'cultural significance [being] embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects' (ICOMOS, 1999: Article 1.2), thus expanding the meaning of significance from the physicality of places to their uses and values attributed by people, acknowledging intra-personal and intra-group differences in valuing places. The emphasis is located on cultural aspects which are likely to be of value to future generations. The 29 articles first issued in 1979 soon influenced how conservation plans in that country would be developed by Kerr in 1982, considering that heritage places have cultural significance, which is important to society, which in turn ascribe various values to heritage places (Kerr, 2004).

Arising from the perception that historical, art or science foci were insufficient to protect oral traditions, expressions, social practices and rituals, the *Convention for the Safeguarding of Intangible Cultural Heritage* (UNESCO, 2003) recognised the need to establish different approaches to material and immaterial culture. This document offers a definition of immaterial culture as concerning a range of 'practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognise as part of their cultural heritage' (UNESCO, 2003). It further recognised its inter-generational nature, as well as the community-nature-history link, which provides 'identity and continuity, thus promoting respect for cultural diversity and human creativity' (ibid).

For architectural heritage, cultural values can be material and immaterial, or tangible and intangible, and the socio-cultural approach to architecture considers the objects and those cultural practices for which objects were created, as well as the meaning attached, as part of a value-based approach to heritage significance. This categorisation of cultural values by UNESCO seems to result from a recognition of a lack of protection to values recognised by the

society. This issue would also be addressed by CoE which recognised the small importance given to cultural heritage as a valuable resource for sustainable development at the *Faro Framework Convention on the Value of Cultural Heritage for Society* (Council of Europe, 2005). By locating the emphasis in the importance of people meanings, rather than objects, in the development of sense of place and cultural identity, the Framework Convention stresses the role and responsibility of society in the management of heritage resources. This idea is clearly expressed in the definition of 'cultural heritage' as 'a group of resources inherited from the past with which people identify, independently of ownership, as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions' (Council of Europe, 2005, p. 3), and introducing the concept of 'heritage community'.

2.3.1 Typology of Historic Values

Each setting and each case has its own range of heritage values. International guidelines generally recognise the built environment's historic, aesthetic, scientific, cultural, social and economic values (ICOMOS, 1964, ICOMOS Australia, 2013, UNESCO, 1972a, Mason, 2002, English Heritage, 2008, Council of Europe, 2005). Among these are intrinsic values such as 'architectural, documentary, archaeological, economic, and even political and spiritual or symbolic' significance (Feilden, 2003, p. 1); and values arising from rarity and emotional attachment (Orbaşlı, 2008, p. 38). Values are further reflected in physical elements, such as architectural styles, building types, construction methods and fabric. For example, Thorosby identified that art work could provide a range of cultural value characteristics, including (2000, p. 28):

- Aesthetic value: beauty, harmony;
- Spiritual value: understanding, enlightenment, insight;
- Social value: connection with others, a sense of identity;
- Historical value: connection with the past;
- Symbolic value: a repository or conveyor of meaning.

Thus, the definition of a typology contributes to the use of values as a research tool by organising knowledge in a way that 'lends comparability to the evaluation of different projects' (Mason, 2002, p. 9). In the definition of methodological issues in the assessing of values, Mason has joined the types of values selected by scholars and organisations, and has set out a provisional typology of values (see Table 2.1)

Sociocultural values of Architectural Heritage	
Historical / Aesthetic / Artistic	Provides a physical connection to the past; capacity to stimulate the senses
Social / Civic values	Supports and symbolizes sociability
Spiritual /Religious values	When integral to the beliefs or practices of a religious group
Cultural/Symbolic or identity values	Capacity to stimulate or maintain group identity, and other social relations

Table 2.1. Provisional Typology of Heritage Values, according to (Mason, 2002).

The values related to use, perceptions, associations, education and spirit are all social values which have increasingly gained importance in the issued documents as the previous Table 2.1 illustrates. However, Mason stresses the need for methodological strategies and specific assessment tools to identify and characterise heritage values in a way that they can be useful according to each case.

It has only recently been clearly recognised in one single document that cultural approaches to architectural heritage, such as protection measures or conservation interventions, should value not just past values but also current values. The explanatory note on 'Article 1.12 Setting' in the revised *Burra Charter* clarifies that 'setting may also include historical and contemporary relationships, such as use and activities, social and spiritual practices, and relationships with other places, both tangible and intangible' (ICOMOS Australia, 2013, p. 3). Historical connections and contemporary relationships are recognised as influencing the cultural significance of heritage places. The revision of the *2011 Madrid Document*, on the conservation of twentieth-century architectural heritage, added to the value of the specific material values of the buildings of this period, found in the building elements and construction processes, and the input of the original designer or builder (ICOMOS ISC20C, 2014), considering cultural input as a social value.

According to the evaluator expertise, the duality between tangible and intangible heritage can offer a convenient framework to approach cultural heritage. If an architect assesses significance, in the case of historic buildings, the focus is mainly on material values as the professional is called to solve problems mainly focused on fabric (Douglas, 2006 , Feilden, 2003). However, if an anthropologist, geographer or social scientist assesses a building, the focus will be on the local culture, the meanings, the use and the relationships between people and the physical environment from the perspective of human experience of place (Vellinga, 2007, Tuan, 1977, Veloso et al., 2014).

'The quest for the "message" of cultural properties requires us [conservation professionals] to identify the ethical values, social customs, beliefs or myths of which physical heritage is the sign, the expression, in time and space. Values of authenticity or identity are advanced in order to reveal the significance of architectural or urban constructions and transformation of the natural landscape through human intervention. In the end, the concept or social representation of the cultural property is more important than the object itself: the intangible dimension prevails' (Luxen, 2003, Tuan, 1977).

The intangible dimension of architectural heritage, in this research on the effects of rehabilitation on cultural values of historic schools, is focused on the effects of physical change of environments and on the experiences that changed physical environments provide to their users. These social values, cultural by nature, felt for the places are those which are assumed as being needed to sustain architectural heritage. Therefore, and having discussed the inherent historic values of architectural heritage, the following sections will address material and immaterial values as contemporary values, and the conservation design stages in which authenticity and integrity are assessed.

2.3.2 Material Culture Values

Architectural heritage as material culture is usually identified by experts, based on theoretical knowledge, accepted heritage identification and assessment criteria. In this process, architectural heritage identity derives from a building's typology, with its purpose and use often driving its design. The understanding of architecture as material culture, however, requires an acknowledgement of the full spectrum of the built environment, from its site to its fittings, furniture and equipment, with the latter 'contribut[ing] to the cultural significance of a place' (ICOMOS Australia, 2000) for their ability to trigger memories and reveal histories. For example, in the case of historic schools, as past educational places, historic fixtures, furniture and scientific collections contribute significance to the place, as they reflect past educational methods and cultural identity, often in places that remain in continuing use.

As Mason observed, 'heritage sites and objects must be understood in relation to their contexts—in other words, holistically (...) One cannot fully understand a site without understanding its contexts, which, perforce, extend beyond the site itself both literally and conceptually' (Mason, 2002, p. 14). The definition provided by EH for 'context' complements that provided by Mason: '[it] embraces any relationship between a place and other places. It can be, for example, cultural, intellectual, spatial or functional, so any one place can have a multi-layered context' (English Heritage, 2008, p. 39). Furthermore, contexts of heritage in this research, further consider places' physical deterioration, the local environmental conditions, and other physical factors.

The material cultural values of historic buildings are found in the original design options built on site, and in the development of the place. The identity of the place can be characterised by a range of design values, for example, character, scale, form, siting, detailing, materials and colour (NSW Heritage Office and RAIA, 2005). Another example, found for the case of school buildings, is focused on the contributions that design makes to the functioning of the building, the quality of the building, its environmental efficiency, its contribution to the surrounding context and its attractiveness (CABE, 2002).

In this research, the value of the place, as a trigger of perceptions of self-esteem, ownership, and sense of collective purpose, is characterised by three main attributes of design. This approach considers historic buildings as cultural heritage sites valuable for the town and for the surrounding landscape, and acknowledges historic buildings as having intrinsic values as well as containing valuable fixed and moveable objects. These value groups are defined below, based on design guidelines obtained through a review of the international literature.

Setting Values

EH defines the concept of 'setting' as relating to 'the surroundings in which a place is experienced, its local context, embracing present and past relationships to the adjacent landscape' (English Heritage, 2008, p. 39). In Australia, 'setting' is 'the area around a heritage place or item that contributes to its heritage significance. It may include views to and from the heritage item' (NSW Heritage Office and RAIA, 2005, p. 5). To identify the locally distinctive patterns of cultural development which define the particular character of a place, therefore, its significance, the concepts of 'townscape' and 'landscape' emerged. EH establishes that townscape looks at 'the relation of built form to topography, landscape and urban layout and identifying landmarks and key views' (English Heritage and CABE, 2008). The Florence Convention on Landscape (Council of Europe, 2000) definition of 'landscape' focuses on the 'perceptions of an area whose character is the result of the action and interaction of natural and/or human factors'. Pragmatically, in Australia Guidelines, it focuses on details that might contribute to the local character, such as height, form and character of fences, garden walls, planting schemes or plant types (NSW Heritage Office and RAIA, 2005, p. 13). Besides the 'specific character, quality, physical, historical and social characteristics of a building's setting' (NSW Heritage Office and RAIA, 2005, p. 5), issues such as the predominant scale of the surrounding streets, the rhythm of the main facades of the buildings, the setbacks which make transition between public space and private spaces, are some physical features which will influence the character of the building.

Historic Building Value

Considering that 'character is defined by the combination of the particular characteristics or qualities of a place' (NSW Heritage Office and RAIA, 2005, p. 5), a place's special character is affected by the relationships between a building and its setting (NSW Heritage Office and RAIA, 2005, p. 2). Furthermore, 'historic character' combines 'particular characteristics or special qualities of a place related to its period or style of construction' (NSW Heritage Office and RAIA, 2005, p. 5). For the establishment of character, the features related to the function of the resource are important for people's perception of the place, for it is important to answer Lawson's question: 'What are the features that most determine how people feel about and react to places?' (Lawson, 2001, p. 237).

As a testimony of its time, place and use, the cultural significance of architectural heritage of the twentieth century may be established 'in its tangible attributes, including physical location, design (for example, colour schemes), construction systems and technical equipment, fabric, aesthetic quality and use, and/or in its intangible values, including historic, social, scientific or spiritual associations, or creative genius' (ICOMOS ISC20C, 2014). Therefore, from the literature review, four groups of components were established to identify the architectural value of historic buildings, forming a 4F approach: Form, Function, Fabric and FF&C (Furniture, Fixtures and Contents).

The value of 'form' is established through the analysis of shape, size, composition, mass/volume, aesthetics/style, scale, facades apertures, patterns of fenestration, etc. with a careful assessment to distinguish between original form and any extensions. For example, the roofline may be a particular element valued for the integrity of a building and contribute to a neighbourhood character (NSW Heritage Office and RAIA, 2005, p. 10). Another example is the windows – an essential element of historic buildings' character. The degree of detail of this architectural element can be found in the dimension, depth and thickness of frames, the materials, the colour and the glass, all in line with the architectural style of an historic building, as listed in the Historic Preservation Education Foundation's guidelines for the rehabilitation of this significant component (Fisher, 1997).

The next 'F' is function. The value of the internal 'functional and spatial layout', i.e., the use organisation in a building, can be found in the way it reflects design period policies of use and construction standards, of well-being and functional perceptions, and of health and security adopted systems. This category is likely, but arguably, the one which has most been altered since original construction, in the adoption to developing needs. The third 'F' stands for fabric,

which is defined as all of the physical material of the place including components, fixtures, contents, and objects which should be retained at that place (ICOMOS Australia, 2013). This research considers 'fabric' the construction materials and systems in place, such as structural, mechanical, natural. Historic movable objects related to the function of the resource are separated and are considered under the fourth 'F': Furniture, Fixtures & Contents (FF&C), in an approach to the acronym used in education refurbishments (FF&E - Furniture, Fixtures & Equipments). These contents can make people remember past events, experiences, feelings and emotions. Some are heritage features from the activity conducted in historic buildings and in the case of historic schools, they are tangible evidence of the history of education and of the social place, i.e., of the people who used such objects to learn and to teach. It is common to find specific classroom furniture (desks, chairs, tables) (Müller and Schneider, 2010), fixtures (clocks, blackboards, lights, plant and machinery), equipment (chemistry laboratory items) and objects (collections, books, students records) in historic schools. Therefore historic schools' contents are cultural heritage of education, which significance relies on their historic, educational, scientific and social value.

In summary, key categories of values and significance indicators of architectural heritage sites which entail historical associations and contemporary relationships have been established: setting, buildings and contents.

2.3.3 Socio-cultural Values

Starting by distinguishing between space and place, and considering that architectural heritage experience enables sensorial perceptions of historic places, this section explores the literature on three concepts which are believed to be sensed by their users: sense of place, sense of continuity and sense of community.

Mason distinguishes between social and socio-cultural values of heritage places (2002). The author considers that social values of heritage enable and facilitate social relations in which the historical values of the heritage might not be central, stressing that the users of a place which is used for social activities that do not depend of, or take any direct benefit from the historic values in place, just consider the shared-space qualities. However, these activities can strengthen social groups with some shared interests (e.g. teachers, staff, and students in a school), and can provide social cohesion, community identity, or other affiliation feelings, which can contribute to a relevant social value: place attachment. Specific heritage and environment characteristics of a place can indirectly contribute to this value category. On the

other hand, Mason considers socio-cultural value the value attached to an object, building, or place because it holds meaning for people or social groups. The reason why this takes place resides in its material evidence of age, beauty or artistry or intangible associations with a significant person or event. Example of a socio-cultural value is the aesthetic value found in the design and evolution of the heritage site which offers sensory experiences, such as well-being (Mason, 2002).

Sensory Experiences: Space and Place

It is widely accepted that space is experienced through activities and practices (ICOMOS Australia, 2000). It has also been said that knowledge of the physical environment, gathered by experience of use, provides well-being, happiness and quality of life (Jorgensen and Stedman, 2001). The phenomenologist Pallasmaa has suggested that 'an architectural work (...) incorporates and integrates physical and mental structures, giving our existential experience a strengthened coherence and significance' (2005, p. 12), further adding that 'architecture enables us to perceive and understand the dialectics of permanence and change, to settle ourselves in the world, and to place ourselves in the continuum of culture and time' (idem, p. 71). This implicit sense of belonging is needed for psychological well-being, and is developed by relationships established with the environment. Therefore, this study requires an understanding of the features of social cultural values as causes of emotions and feelings for places, provided by places.

The concept of 'place' has been researched by several authors, who agreed that place is space endowed with meaning (Low and Altman, 1992, Relph, 1976, Tuan, 1977) and is the outcome of the interaction between physical setting, activity and meaning (Relph, 1976). The concepts of 'place identity', 'place attachment', and 'sense of place' involve the relationship of people and their physical environment to which meanings are attached. In human geography, cultural geographer Tuan explored the relationship between people and environment in the article 'Space and Place: humanistic perspective' where it is argued that space is location while place is a 'unique entity' which 'has a history and meaning'... 'a reality to be clarified and understood from the perspectives of the people who have given it meaning' (Tuan, 1979, p. 387). Time is required to create place (Lynch, 1972, Tuan, 1979) as they are 'locations in which people have long memories' (Tuan, 1979, p. 421).

According to EH, in *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment*, 'the term "place" goes beyond physical form, to involve all the characteristics that can contribute to a "sense of place"' (English Heritage, 2008,

p. 14), including under the ground or sea, considering the qualities that people (not least practitioners) perceive as having a distinct identity. Again, this definition highlights the perceived need of time, people's perception, and identity as distinctive characteristics of places. In summary, for a space to be considered a place, it involves the interplay of affect and emotions, knowledge and beliefs, and behaviours and actions in reference to a space (Altman & Low, 1992; Proshansky et al., 1983).

In 2000, EH issued *The Power of Place* (English Heritage, 2000) stressing the link between heritage and the creation of a sense of identity or place. The idea of 'sense of place' arises from the local distinctiveness of the built environment (Castree, Kitchin and Rogers, 2013b), considered interchangeably by some authors (e.g. Stubbs, 2004). A historic place, or its character-defining elements, contribute to achieve a sense of place, which has been linked to cultural identity (Russell, Smith and Leverton, 2011). Furthermore, the process that attaches particular features of a place that contribute with its uniqueness to an individual's self-concept has been named 'place-related distinctiveness' (Twigger-Ross and Uzzell, (1996). Whilst this refers to a place's historic values, immaterial values' importance arises out of their contemporary significance to current use, rather than exclusively from past associations. On the other hand, 'placelessness' is felt when an environment lacks significant places, for example by applying standardised solutions which may homogenize originally different environments, in which case the inherent effect of a lack of attachment to place may occur (Castree, Kitchin and Rogers, 2013a). The feeling of placelessness in architectural heritage conservation can occur as homogenisation examples can be found in the application of standard planning regulations, functional-spatial models, solution-types for structural problems, standard materials or industrial furniture.

The identification of the phenomenon of the establishment of affective bonds with places has been using a range of terms, such as 'rootedness, sense of place, belongingness, insideness, embeddedness, attachment, affiliation, appropriation, commitment, investment, dependence, identity, etc.' (Giuliani, 2003, p. 138), which indicates uncertainty towards a unique definition.

Broadly researched, place attachment literature provides frameworks for its definition and assessment (Scannell and Gifford, 2010, Brown and Raymond, 2007, Williams and Vaske, 2003). Generally, researchers considered 'place attachment' to be individuals' commitments to their neighbourhoods and neighbours, therefore a phenomenon where several independent dimensions enabled individuals to select the type of bond to establish with places (Gerson, Steve and Fischer, 1977 in Giuliani, 2003, p. 145). In this perspective, four types of attachment

were identified: 'institutional ties, that is, belonging to local institutions, social activity, the degree of involvement in neighbourhood organisations and social interaction with neighbours, local intimates, the presence of friends or relatives in the neighbourhood (...) "affective attachment", as measured by the satisfaction with the neighbourhood and the desire for residential stability' (Giuliani, 2003, p. 145). For example, in the case of attachment to public facilities, all of these types of attachment are expected to be found.

'Place identity' has been defined as the significance of physical settings and their properties in regard to self-identity (Proshansky, 1978, p. 148). This incorporation of place in the self (Proshansky, Fabian and Kaminoff, 1983) is made possible through the interpretations and ideas about a specific physical environment, and the environment in itself. Acknowledging that the physical environment affects human identity, research on the relationship between place and identity tested four principles of identity in relation to attachment to a residential environment: continuity, self-esteem, self-efficacy and distinctiveness (Twigger-Ross and Uzzell, 1996). Evidence was found on the relationship between place and identity with inspiring results for the present research on self-esteem linked to the prestige of a place, the use of place as warrant of continuity of the self, and the use of place identification to establish distinctiveness over other places.

As a cognitive dimension, place identity gives meanings to the relationships established between self and place. Complementary, as an effective dimension, place attachment is found in feeling towards the place:

'Place attachment and sense of belonging are crucial in order to establish an emotional and cognitive bond with a place, which leads to the feeling of security and sense of community. Thus, identity of a place is more than just the physical appearance, but also involves a «meaning» for the individual and the community' (Kaymaz, 2013, p. 740).

Within sense of place there is a conative dimension which induces a sense of place dependence, as a behavioural exclusivity of the place in relation to alternatives. Resource dependence identifies the importance of the place for doing an activity, for example a school, which as an educational function, has the potential for public education, for teaching and learning, for which it further has an education value. Research on measuring place attachment demonstrated that 'in essence attachment involves some form of preference for or bonding to the setting', stressing that 'preference may be for purely functional reasons (...) or the place may take on some special significance for the customer that has an emotional or symbolic character' (Williams and Roggenbuck, 1989).

In summary, 'sense of continuity' is a category linked to past traditions, or to one's past as part on one's life in the present. As a social benefit for enjoyment, the sense of continuity has been recognised by EH as one of two benefits for people who uses historic places, along with a source of identity, which provides a cultural resource for learning. Both give distinctiveness, meaning and quality to places (English Heritage, 2008, p. 67). The sense of continuity is further felt in the case of establishing bonds due to historic associations, a case observed in schools where family members preserve the tradition of attending the same school, where memories are passed from one generation to the next.

Finally, the 'sense of community' is the association with, or public esteem felt for, the place, found in the establishment of strong shared feelings. Significant historical themes, activities or events that took place in an historic resource can trigger the association value. Institutions and individuals need that evidence from the event to remain in place, sufficiently intact to convey that relationship to an observer. The sense of community affects people's perceptions of their place, of their social relations and even of their empowerment in a place, for it is important that people feel linked to their communities, sharing meanings and values for a place.

Contemporary relationships with historic places are induced by stakeholders' experiences, which are influenced by current integrity and authenticity of the place. Three concepts were set out to be used in the conceptual framework for the establishment of historic schools significance: sense of place, conceptualised as the result of understanding the place identity, the attachment felt to the place, and the dependence on the place. Sense of continuity is set out as the consequence of past memories, personal or from relatives, or the perception of the place as unique or rare; and sense of community, which was conceptualised as being achieved by the sharing of meanings, values and esteem associated with the historic place.

2.4 Cultural Values of Twentieth-Century Architecture of Education: schools

Thematic frameworks are tools to systematise architectural heritage, enabling the identification and comparison of characteristics that inform an understanding of the uniqueness and/or rarity of an historic building. Inventories and listed buildings use these systems. As it has been recognised, school buildings are 'cultural artefacts that reflect the

values of a community long after the original stakeholders who envisioned, planned, designed, and built them are gone' (Lackney, 2011, p. 353). This section discusses different approaches for recognising twentieth-century architecture's heritage values, focusing on school buildings as an architectural heritage typology of the twentieth century. This strategy stresses the need for additional research and protection of this heritage building type.

2.4.1 Architectural Heritage Typologies

In the eighteenth-century, Quatremère de Quincy introduced the idea of 'typology' in the analysis of buildings (Markus, 2001, Forty, 2000), where 'type' is suggested to refer to ambiguity, flexibility, spatial relations and use (cited in Gulgonen and Laisney, 1982, pp. 26-27). The distinction between type and model was described:

'[the model] is an object that should be repeated as it is; contrariwise, the *type* is an object after which each artist can conceive works that bear no resemblance to each other. All is precise and given when it comes to the model, while all is more or less vague when it comes to the *type*' (de Quincy and Younés, 1999 [1788], p. 255)

Type is further considered to be 'always evident to feeling and reason' (idem, p.256) from which architectural types 'the principle after which an art, that is perfected in its rules and in its practices, was modelled' is 'used to designate certain forms which are characteristic of the building that receives them' (idem, p.256). In summary, de Quincy conceived 'type' as the originating reason of a thing, and 'model' the complete thing. This approach was further developed by the art historian Argan who argued that a 'type' could only exist after a series of existing buildings have demonstrated that they have formal and functional analogies (Argan, 1996). 'Type' would become the foundation of historic buildings protection system which considers building types according to formal and functional architectural attributes.

In the seminal book *A History of Building Types* (Pevsner, 1976), three linked narratives on functions, materials and styles were used. The sequence in the themes took into consideration the assumption that function and use of buildings need to be assessed before aesthetic and style are, considering the latter as 'a matter of architectural history [and a] function of social history' (Pevsner, 1976). Since the industrial revolution, architects have conceived buildings for new functions, providing answers for contemporary problems, such as health, education and security. For example, research on the plan layouts of these new functional buildings revealed hygienic concerns and social needs that were considered in their design, characterising this period. Discussing hospitals and prisons, Pevsner explains the reason why educational buildings, as universities and schools, have been excluded from the research, by considering

that the work would then take 'unmanageable proportions' ('About this book' in Pevsner, 1976), hinting that a wide range of changes in planning such facilities to meet changing educational needs might have taken place.

Twentieth-century heritage uses new construction materials and experimental construction techniques, which are vulnerable to time and changes (MacDonald and Ostergren, 2011), which have led to a growing interest in the identification of twentieth-century heritage values and its conservation among professionals and scholars (idem). Working on the same topic, ICOMOS, in its role of advisory body to the World Heritage Committee, has also conducted thematic studies for the World Heritage Convention to contribute to the assessment of candidatures to World Heritage listings. Although the importance of school buildings as twentieth-century heritage is generally emphasised by regional and local thematic frameworks, there are no specific studies on twentieth-century education heritage.

The identification and assessment of twentieth-century heritage still largely remains, leaving buildings of this period at risk and in urgent need of understanding and protection (MacDonald and Ostergren, 2011). The Recommendation n. R (91) 13 on the Protection of the Twentieth-Century Architectural Heritage (Council of Europe, 1991) defines a thematic framework for heritage assessment, which aims to promote its identification, conservation and presentation. The architectural indicators of this type of built heritage are style, building types, method of construction and period of construction, which need to be inventoried. For protection purposes, this European Recommendation also considers 'works of the most famous designers; cases where the significance comes from the architecture and history of the time, although had produced less well known examples; contribution to history of technology, political, cultural, economic, social development'. It further considers 'every part of the built environment including public spaces and decorative features'. Finally it suggests, for managing purposes, the 'training of specialist professionals'.

Consultation of world architectural heritage classification lists indicates that, in general, there is a lack of protection of more recent heritage. Not all significant twentieth-century buildings are classified, and therefore not legally protected. Many are simply recorded on national or international inventories, such as currently available online databases (the DOCOMOMO International Register, DOCOMOMO US Register, UIA Twentieth-Century Architectural Heritage Repository and UNESCO Modern Heritage Programme).

ICOMOS has an international scientific committee on twentieth-century heritage (ISC20C), which aims to support ICOMOS initiatives regarding the conservation, management and interpretation of twentieth-century heritage places. Within this programme an historic

thematic framework to assess the significance of twentieth-century heritage was the topic of an expert meeting in May 2011 (MacDonald and Ostergren, 2011). Additionally, in 2012, the Getty Conservation Institute program Conserving Modern Architecture Initiative (CMAI) aimed to advance the conservation practice of the twentieth-century heritage by identifying and addressing conservation challenges. Joining DOCOMOMO, ICOMOS, and the UIA, the meeting aimed to support contextual understanding of twentieth-century heritage national and regional bodies amongst others who were responsible for the identification and protection of heritage places' (idem, p. 7). The aim of the meeting was to reflect on conceptual approaches to create an international flexible structural model for the analysis of twentieth-century heritage sites, where 'themes', 'phenomena' or 'drivers' could overlap or combine, among which education is referred to as a key historic category of twentieth-century heritage. Finally, national frameworks from Canada (Parks Canada, 2000) and Australia (Australian Heritage Commission, 2001) were used to identify a framework that starts from the concept of 'use', identifying ten categories, and the impact drivers of 'social, political and economic conditions' which then identify subthemes. For example, in this context, schools are referred to as a subtheme of education (Australian Heritage Commission, 2001).

The International Union of Architects (UIA), founded in 1948, has a working programme for Cultural Identity–Architectural Heritage which aims to 'harmonise and promote professional know-how in restoring and rehabilitating architectural heritage'. The awareness of the need to maintain and protect representative elements of architectural heritage requires frameworks for their identification. In the literature, several thematic approaches are currently debated. For example, in order to achieve better representation of properties on the World Heritage List, the World Heritage Committee requested ICOMOS to analyse the list using three complementary analytic approaches (Jokilehto et al., 2005), including a typological framework (based on categories for the classification of cultural heritage previously used); a chronological/regional framework (which classifies cultural heritage in relation to time and space); and a thematic framework (which classifies the relationship between people and things, and allows new aspects and contexts to be included in the World Heritage List). The approaches should be implemented in a specific order: 'the identification of the meaning and relative value of a property should start with the identification of the themes, then proceed to the chronological-regional assessment, and finally define the typology to be proposed, whether for a monument, an ensemble or a site' (ICOMOS, 2008, p. 16). The thematic framework expands the cultural and natural division provided by the WHC in 1972, proposing seven main themes, where Cultural Associations, such as human interaction in society, and

cultural associations and branches of knowledge, are separate expressions of creativity, where categories of Monuments, Groups of buildings and Sites now stand.

2.4.2 Historic School Buildings

In England, research on England's Schools (Harwood, 2010) provides specific guidance and criteria for the listing of historic school buildings. The EH subsequently issued a guide to outline the selection criteria for the designation of schools (English Heritage, 2011a). For example, schools built between 1914 and 1945 are suggested to have their architectural quality and intactness considered, and those selected should reveal special design interest and special features (e.g., panelling, fitted furnishings, historic libraries and science laboratories).

In Canada, a *Guide d'interventions architecturales pour les édifices scolaires* (Déom, 2007) was developed alongside the research on the 'Preservation of the Montreal School Board Historic Schools', which compiled an inventory of all of the school buildings owned by the School Board, clearly establishing their heritage value (Déom, 2008). This work was followed by a thematic research on the 1920s-1930s Art Deco schools (Déom and García, 2010). However, attention has been given to schools beyond spaces for education:

'First, schools are much more than bricks and mortar, they are symbols of our commitment to education. (...) Second, physical settings can motivate us or discourage us. (...) If places have such lasting effects on people's lives, then it makes sense that those places in which we spend time should be designed expressly for us. In schools, this means designs that inspire good teaching, support productive learning, enhance people's joy, and prompt feelings of security. Finally, school buildings are more than bricks and mortar, and they are more than a container for teaching and learning – the physical setting in which learning takes place impacts how we teach, how we learn and how we feel about ourselves and others' (Lackney, 1999, p. 2).

Finding gaps in the representativeness of cultural heritage categories on the World Heritage List, ICOMOS proposed three frameworks: typological, chronological-regional, and thematic (Jokilehto *et al.*, 2005). In this system, school buildings were inscribed as 'Expressions of Creativity - Section A. Creating and Using Monuments - Subsection 6. Educational and public welfare architecture'. Three years later, the framework was adjusted and schools are now considered in '2) Creative responses and continuity (Monuments, groups of buildings and sites) - Educational and public welfare architecture' (Jokilehto *et al.*, 2008), stressing the continuity of the building and of the use as a desirable preservation option. Recognising that there was a lack of attention to this type of heritage, and to the changes being made to historic schools, ICOMOS, in 2013, established the International Day for Monuments and Sites celebrated 'The Heritage of Education', including all kinds of heritage assets related to education.

2.5 Sustaining Cultural Values of Historic Buildings within Changing Contexts

This section approaches the issue of sustainability of architectural cultural values in contexts in which changes in historic buildings, particularly in public facilities, are required. Relevant thoughts on constancy and change, of the built form and of its users, have been described by Rapoport:

'Attaching so much importance to the culturally linked aspects of built form tends to lead to a position of complete relativism. As soon as a given culture or way of life has changed, its form would become meaningless. Yet we know that many artifacts retain validity when the culture which created them has long since disappeared, and that housing and settlement forms are still usable, even though the meaning attached to the forms may have changed very greatly' (Rapoport, 1969, pp. 78-79).

The approach to historic schools change, for example in the case of Portugal, needs to be aware of the school culture in place, i.e., of the institution values which dictates the expected behaviours and predicts the perceptions to be taken from the experience of the place. Rapoport recalls that evidence has shown that 'perception and behaviour are culturally linked, and therefore changeable' – a reaction expected from the rehabilitation and modernisation of buildings. However, if the adaptation of historic buildings aims to enhance well-being and provide modern environments, it seems a paradox that cultural conservation theory advocates the constancy of values, material and immaterial, not its change, when it is known that according to contemporary life standards, interventions in historic buildings require change in the historic fabric. Therefore, architectural conservation becomes a context for social change, by providing new and enhanced experiences, enhancing perceptions and inducing the ascription of meanings and the establishment of associations.

Nevertheless, and considering that culture is always developing and changing with the development of society, it is not strange to find in heritage policy recommendations for a cautious approach to the interpretation of cultural significance, which acknowledges that time, use, or new information may change the values ascribed to historic buildings (ICOMOS Australia, 2013). The most recent *Nara +20 Text* alerts that changing perceptions and attitudes over time require authenticity assessments to be periodically updated (ICOMOS-Japan, 2015). Authenticity does not only rely on the physical element but also on its interpretation.

2.5.1 Sustainability of Architectural Heritage Significance

Sustainable development is defined in the *Brundtland Report* as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (World Commission on Environment and Development, 1987), the success of which involves economics, equity, and environment. Soon after the publication of this document, at the Rio Earth Summit in 1992, world leaders formulated Agenda 21, which calls for architects, among other professionals, 'to make a more open and effective contribution to the decision-making processes concerning environment and development' (Article 31.1 in United Nations, 1992).

Retaining historic buildings rather than replacing them is widely accepted as a sustainable heritage conservation principle as it preserves the existing 'embodied' energy in materials, transport and construction, for which the continued use of existing buildings is recommended. This type of sustainability, regarding the built environment, has been recognised in the past as a shared responsibility of architects, as the official guardians of buildings values, and the public, as 'protectors' of ancient buildings, holding both accountable for 'protect[ing] our ancient buildings, and hand them down instructive and venerable to those that come after us' (Morris, 1877). Therefore, more than a century after, sustainability is still more than just about historic buildings and architects conserving material values of the past; it is also about the present users, the communities and the stakeholders of historic buildings, which find their cultural and social identity in these historic resources, and sustain their significance.

2.5.2 Sustainability in the Context of Architectural Heritage Change

In the context of changing architectural heritage, prior to any action, the state of conservation needs to be recognised by gathering information on the physical condition of the buildings and on the factors affecting the property (UNESCO, 2015), for example type of use, climate impact and materials ageing. Two other important assessments must be undertaken: examining the conditions of integrity and authenticity. The concept of 'authenticity', as described in the *Nara Document* (UNESCO, 1994), highlights the respect for social and cultural values of heritage as the tangible and intangible expressions of each culture. The responsibility for heritage management is suggested to lie therefore firstly in the community that created the cultural heritage and secondly the custodians of that heritage. This approach requires the definition of values within a property's cultural context setting, negating the possibility of establishing fixed criteria to judge values. Additionally, the *Nara Document* offers some features which

contribute to establishing cultural heritage attributes of material and immaterial values: 'form and design, materials and substance, use and function, traditions and techniques, location and setting, and spirit and feeling' (UNESCO, 1994). These sources of information contribute to judging authenticity, framed by the cultural heritage itself, and its evolution through time. In Nara +20, the concept is assumed to be a culturally dependent quality that is associated with cultural heritage, which is acknowledged as an evolving tradition expression, which in turn contributes to group identity (ICOMOS-Japan, 2015).

In the assessment of authenticity, *Operational Guidelines (OG) for the Implementation of the World Heritage Convention* further stress that a place's 'meaning [is] accumulated over time' (UNESCO, 2015, p. 17). Attributes such as spirit and feeling are further considered 'important indicators of character and sense of place, for example, in communities maintaining tradition and cultural continuity' (idem). Conditions of integrity, defined as a 'measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes' (UNESCO, 2015, p. 18) further contribute to the establishment of cultural significance.

In the case of historic school buildings, its sustainable adaptation needs to retain evidence of the past in the present use, which should enable current needs in order to allow future enjoyment. Although the activity of rehabilitation of historic buildings has existed for centuries, never before have heritage values been so important for sustainability. The current perception of the need to balance economic, cultural, environmental and social factors to achieve a sustainable conservation has brought new challenges for architecture practitioners. This topic is further discussed in the next chapter.

2.5.3 Sustainability in the Context of Socio-cultural Change

Architectural typologies are the result of functional and aesthetic responses to users needs. Buildings are required to adapt to a range of changes during their lifetime. For example, in the case of institutions, changes on the ethos itself may require changes to the buildings where they develop their activities. Or, to change an institution's ethos, changing its physical environment might be considered. Therefore, it can be argued that social alterations result from changes in material values, as much as physical material alterations change social behaviours, which is reminiscent of the abovementioned quote by Winston Churchill (see section 2.2.1)

The sustainability of architectural heritage is then assumed to be linked to an inclusive approach to heritage management, with the participation of stakeholders (Council of Europe,

2005), and particularly of targeted users of the heritage in the case of schools. However, heritage values are not static, as 'they depend on the social groups that participate in ascribing them and they can change over time, aligning themselves with (or reacting to) shifts in wider social, cultural, environmental and use values' (UNESCO et al., 2013, p. 27). From the above mentioned, it can be concluded that community engagement should be targeted; however, caution should be taken when considering their assessment as this can often lead to problems.

2.5.4 A (Double) Cautious Approach to Change

The most widely accepted principle regarding physical change in architectural heritage recommends to 'do as much as necessary to care for the place and to make it useable, but otherwise change it as little as possible so that its cultural significance is retained' (ICOMOS Australia, 2013, p. 1). This cautious and quantitative approach to change should be guided by the appropriate interpretation of the place's cultural significance. Taking into account future generations, which will develop current knowledge, it may be considered that current interventions have a negative effect on existing significance, in which case reversible changes are advised (English Heritage, 2008, ICOMOS Australia, 2013).

With the understanding that knowledge evolves with time, what is interpreted today as 'enhancing' might be, in the future, considered to be a negative change and therefore, all changes should be reversible. This notion that heritage is in a continuous change has been recognised in the *Krakow Charter* (ICOMOS, 2000). This dynamic process of change accepts that individual elements that bear specific values that make them unique, may remain the same, but its values may change. Although certain qualities of historic buildings may endure, it is important to acknowledge that the aging of the physical elements, the deterioration of a site (Agnew, 1997 in Williams, 2010, p. 104), the change of meanings in time, the change of use (Avrami, 2000, p. 19), and new information meanwhile obtained (ICOMOS Australia, 2013) may change values. This aspect also calls for a cautious approach, this time to the interpretation of cultural significance.

2.6 Recognition and Assessments of Significance

Frameworks have been established for the assessment of cultural significance, which pursue two objectives: to protect cultural properties and to evaluate potential impacts of conservation proposals in cultural heritage sites. This section describes the values-based approaches found in architectural heritage policy on the protection of cultural heritage values, developed to protect cultural assets and to evaluate potential impacts of conservation proposals, focusing on education buildings. Existing assessment frameworks are examined and critically evaluated, identifying methods used, sources of data and areas in need of empirical evidence.

2.6.1 Protection by Listing through Designation

Although EH uses the term 'designation' to refer to 'any formal recognition of heritage value, including registration, listing, scheduling and inscription' (English Heritage, 2008, p. 14), in this research the term 'listing' will be used for that same purpose.

Jokilehto (2005) finds concrete evidence of efforts to protect architectural heritage for its historic value during the French Revolution and the Napoleonic period. However, not until much later would documents be specifically issued to preserve historic buildings, and it is only the relatively recent establishment of international organisations dedicated to the protection and conservation of the world's monuments and sites that has led to a recent surge in defining 'cultural heritage' specifically with a view to safeguarding heritage (cf. Jokilehto, 2005, for a review of definitions most employed by UNESCO and ICOMOS).

For listing and protection purposes, a cultural significance assessment is established with the main objective being to produce a statement of significance which identifies why a place is of value (ICOMOS Australia, 2000), so that protection by listing can be set out in law. Significance assessment is a qualitative technique to evaluate the relative importance of cultural heritage items for management purposes. The process uses systematic criteria to establish what is important about each item, which are the item heritage values. The end product is a statement of cultural significance which summarises the meanings and values of an item in relation to other comparable items. According to the *Burra Charter*, significance is generally assessed in four fields of value: historic, aesthetic, scientific [research] and/or social value which an item - document, object, site, building or collection - has for past, present and future generations.

The assessment of significance therefore follows four steps: 1. Research the document's material / technical / contextual history; 2. Analyse and record fabric, mainly developments and physical condition; 3. Identify comparative examples to establish relevance; 4. Assess significance against the criteria. Most systems of architectural heritage protection follow this sequence of actions, as the following methods which are now discussed.

World Architectural Heritage Protection

To facilitate the implementation of the WHC, Operational Guidelines (OG) are periodically revised. As the definition states, Outstanding Universal Value (OUV) is considered in three areas: history, art or science. These values need to be recognised to be exceptional for present and future generations of all humanity in order for the building to be nominated as WH. Criteria for the assessment of OUV considers that, beside meeting the conditions of integrity and/or authenticity, one or more of the following criteria need to be met by the cultural heritage property (Article 77 in UNESCO, 2015):

- (i) Represent a masterpiece of human creative genius;
- (ii) Exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;
- (iii) Bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;
- (iv) Be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;
- (v) Be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;
- (vi) Be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance.

To use this criteria, attributes of properties, i.e., tangible or intangible features which are associated with or express the OUV, need to be assessed. The OG indicate a range of types of attribute including: form and design; materials and substance; use and function; traditions, techniques and management systems; location and setting; language, and other forms of intangible heritage; and spirit and feeling (Paragraph 82 in UNESCO *et al.*, 2013). The WHC sets states' duty to adopt a heritage conservation code of ethics and to define protecting and preserving measures for cultural heritage. Several countries have adopted these criteria into their national heritage protection systems, such as Portugal which signed this convention in 1979.

Regarding the formal recognition of heritage value of schools, ICOMOS has raised the question: 'Is there a proper recognition of buildings, ensembles or sites related to education?' (ICOMOS, 2013) Currently, the heritage properties linked to education inscribed on the

UNESCO World Heritage List are: the sites of the Bauhaus (Germany), the university and historic precinct of Alcalá de Henares (Spain), the university campuses in Caracas (Venezuela) and Mexico City, and the recent inscription (2013) of Coimbra University (Portugal). However, ICOMOS has recognised that proper protection and recognition has not yet been given to several cultural properties linked to education that bear historic, artistic or social values, and stressed: 'It becomes thus necessary to insist on the fate of schools and university campuses as these are two concrete forms of this heritage, often neglected as we focus our conservation interest on the education programmes instead of the buildings and places themselves' (ICOMOS, 2013). Educating for heritage in heritage schools is suggested as an exceptional opportunity.

Furthermore, architecture from the twentieth century is perceived has not having enough time distance to be recognised as heritage property that deserves to be protected. Therefore, research and the elaboration of inventories have been set out. For example, in 2000 ICOMOS set the bases for an International Scientific Committee (ISC) on twentieth-century heritage. Later, in 2005, ICOMOS identified that the World Heritage List had only 12 listed places from the twentieth century, out of a total of 700, demonstrating how underrepresented heritage from this period was and raising the awareness for the dangers these cultural resources and evidence are facing.

European Protection

European Guidance for the protection of cultural heritage has been issued by CoE, such as the *Granada Convention* (Council of Europe, 1985a) adopted WHC categories of property, namely a Monument, Group of Buildings and a Site. However the definition of monuments was widened by considering, in its Article 1 'all buildings and structures of conspicuous historical, archaeological, artistic, scientific, social or technical interest, including their fixtures and fittings', calling for evidence of six types of values, and including buildings contents. This Convention for the Protection of the Architectural Heritage in Europe, ratified by Portugal in 1991, established the need to maintain inventories of architectural heritage at national levels and, more important, that each state implement statutory protection measures. This policy ensures that supervision and authorisation procedures be put in force when, in protected properties or their protection areas, new buildings are erected or existing buildings are proposed to be demolished or altered, therefore avoiding disfigurement, dilapidation or demolition of protected properties, or negative impacts in their surroundings.

In summary, it was found what Stubbs has identified as the lack of an analytical framework to assess the cultural, social, and sense of place values in historic buildings (Stubbs, 2004) – a holistic assessment tool. In practice, Feilden suggests that three value types inform a statement of significance of a cultural property: emotional (continuity, wonder, identity, symbolic), cultural (historic, documentary, scarcity, aesthetic, landscape, townscape, architectural, ecological, technical, scientific) and use (functional, economic, social, educational, political, ethnic) (Feilden, 2003, p. 6), which will inform the tool to be designed for the evaluation of historic school significance.

2.6.2 Assessment Tools

Considering that a 'value-based judgement' is 'an assessment that reflects the values of the person or group making the assessment' (English Heritage, 2008, p. 72), and that Mason stated that 'no single value assessment method will give perfect, total, or even adequate knowledge to inform conservation decisions on the ground' (Mason, 2002, p. 14), assessments of values are complex, for which assessments of change of values are even more complex.

One of the purposes of ascribing value to heritage sites and buildings is to support management decisions about its future (Schofield, 2008), with specific reference to protecting and managing the transition between past and future, and the ability of past material values to function as resources (Lipe, 1984, p. 2). The systems currently in place for the management of change apply tools for measuring predicted impact of proposals with reference to pre-established benchmarks. These benchmarks are currently values-based and are set out in a Conservation Plan. The current available frameworks to assess impact are following described.

In Australia, the architectural historian and heritage practitioner Kerr, who participated in the design of the *Burra Charter*, established the *Conservation Plan* (Kerr, 2004), at the time a guide to the process established in the *Burra Charter*, following a logical sequence, to be applied for establishing landscapes significance and to develop a document to guide and manage change. These plans are written documents which explain why a site is significant and how that significance could be retained in any future change. Firstly, it assesses the heritage place as evidence, entailing its aesthetic, historic, scientific and social values. Secondly, associated significance is assessed in historic registers which may relate to incidents, events or popular affection. Thirdly, contextualised questioning of 'scale, form, materials, textures, colour, space and the relationship of components' (Kerr, 2004, p. 13) is argued to provide an understanding of significance. In this sense, the relationship of a place to its setting can further contribute to

the concept of cultural significance. Conservation plans, based on Kerr framework, have been implemented in the UK (Clark, 1999).

EH established a values-based approach which guides heritage significance assessment. This philosophical framework *Conservation Principles* (English Heritage, 2008), published and formally adopted in 2008, set out the values and criteria by which historic assets can be evaluated, addressing the understanding of heritage values of places, setting out four categories of values: evidential, historical, aesthetic and communal. As an example of a practical use of a typology of values in the context of conservation management plan, the Heritage Lottery Fund considers the following values: historic, natural or scientific interest, aesthetic or architectural interest, a source of evidence or knowledge, social or community value (including spiritual values) (Heritage Lottery Fund, 2008, p. 12).

2.7 Summary and Conclusions

Cultural Significance is an important concept in the context of architectural heritage as it contributes to informed management and includes the values of the heritage community (Council of Europe, 2005). From this literature review, a framework of values, based on tangible and intangible values and on historical and contemporary values, was set out to contribute to establish tailored assessment methods to buildings types, particularly in the case of twentieth-century architecture. The proposed tool breaks down significance into three constituent categories: historical significance, and contemporary design significance and socio-cultural significance. The literature recognises historic buildings to be an irreplaceable cultural heritage, a tangible and intangible legacy, for which they should be kept in use and updated to current use needs, while safeguarding and enhancing the heritage place significance. In fact, international policy strongly suggests that cultural heritage contributes to the enhancement of the quality of life and to the sustainable development of societies and therefore should be conserved (Council of Europe, 2005). In the last decade, the architectural conservation debate has been shifting from an understanding of conservation as a physical intervention, towards increasing the attention given to cultural values.

Architectural heritage significance can be conceptualised as involving three categories of values: historical, design and sociocultural. Attributes of the propose types of values, design-material and socio-cultural-immaterial, were briefly identified. This typology of values will

facilitate participation, discussion and understanding of the values (Mason, 2002) in the assessment of significance, lending comparability to the evaluation of different heritage resources. International guiding principles currently consider that cultural significance needs to address cultural heritage in its regional context and specific time, as a space and as a place, considering stakeholders' socio-cultural values alongside architectural values. Therefore, current cultural architectural heritage theory supports a values-based approach to historic buildings, as it provides a method of presenting a place's importance and of identifying the elements to which that importance is given.

Although the cultural significance of school buildings as twentieth-century heritage of education may be recognised at national level in some countries, historic schools are an architectural typology underrepresented in the WHL. Protection and attention is needed as changes are being made to historic schools. These are generally valued for their architectural history, social history, and structural, material, formal and functional characteristics, which make them significant as representative of buildings from the last century. However, the sustainability of cultural values is a complex issue. Beside the traditional focus on historic values and historic fabric, the review of current conservation guidance reviewed highlighted the emerging focus on contemporary social values, which are assumed to change as a result of time, context, stakeholders, etc. This finding suggests a holistic approach to architectural heritage values, from a wide range of different stakeholders, including experts, local community and school community, in the case of historic schools. In a context of interventions, such as rehabilitation, the sustainability of cultural values is a complex issue. Mitigation of actions which may negatively affect historic buildings' cultural significance is an important issue, although prevention measures do not assure successful interventions, as prediction cannot guarantee results.

The following Table 2.2 establishes a framework to assess the cultural values categories highlighted by the literature review, indicating sub-categories and attributes of values. The assessment of change in cultural significance finds in the proposed framework a benchmark to establish the differences in each values category, and in each component, by comparing data on the value attributes found before and after interventions.

	Significance Categories (values)	Significance Indicators (attributes of values)
MATERIAL CULTURAL VALUES	Setting	Spatial context Visual landmark Accessibility
	Townscape	
	Landscape	Building(s) location/dimension Use Accessibility
	Architecture	Form Functional-spatial layout/use Fabric
	Contents	Fixtures Furniture Equipments
IMMATERIAL CULTURAL VALUES	Sense of place	
	Place attachment	Affective dimension: feelings toward the place
	Place identity	Cognitive dimension: beliefs about the relationship between self and place
	Place dependance	conative dimension: behavioral exclusivity of the place in relation to alternatives
	Sense of continuity	Memories Rarity or uniqueness
	Sense of community	Collective esteem Shared meanings and values

Table 2.2. Cultural Values Categories

This literature review was informed by the researcher's own experience in architectural interventions in built heritage and by the firm conviction that architecture is a timely cultural expression of a cultural action: architectural thought. A values-based approach to architectural conservation emerged as the current theoretical approach in international policy, for which cultural significance is relevant for practice (to implement), for policy (to guide), and to theory (to develop), as it confirms the currently recognition of socio-cultural value. A lack of significance recognition, and therefore, insufficient conservation input, suggests a gap in knowledge about the effects of interventions on architectural heritage, which can only be fully appreciated at a post-intervention stage. Therefore, the *Amsterdam Charter* statement on architectural heritage being 'in danger', as it is threatened by ignorance, obsolescence, deterioration, neglect and 'ill-considered restoration' (Council of Europe, 1975, p. 2), is still up-to-date. These threats to the 'irreplaceable cultural, social and economic values represented by historic monuments, groups of old buildings and interesting sites' (idem, p.1) can still be observed.

In summary, international guiding principles currently consider that cultural significance needs to address cultural heritage in its regional context and specific time, as a space and as a place, considering stakeholders' socio-cultural values alongside expert architectural values. However, a gap in knowledge emerged concerning the assessment of actual effects of such interventions on existing heritage values, historic and current. This lack of knowledge, and lack of practice, neither contributes to improve conservation interventions nor to the mitigation of actions which may negatively affect historic buildings' cultural significance. Further research is therefore needed.

The chapter findings imply that a holistic tool is needed to assess material and immaterial values, and to assess actual effects of physical change on material and immaterial values of architectural heritage. This finding supports the research objective: designing a values-based assessment tool for evaluating actual change in cultural significance, for the case of historic school buildings in Portugal. The next chapter discusses rehabilitation as the trigger for change in cultural significance.

Chapter Three. Establishing Change: The Cultural Process of Architectural Rehabilitation

3.1 Introduction

This chapter discusses change of cultural significance in the context of the conservation cultural process of architectural rehabilitation (section 3.2), followed by the discussion of current trends and debates on the issue of change in the general context of conservation (section 3.3) and focus on rehabilitation design, in and historic context (section 3.4), as the process of change of material, and immaterial, cultural values, for which reflections on the ethics of architectural practice are provided. Finally, this literature review focuses on available tools to assess change (section 3.5), making the case for the design of a holistic tool for architectural conservation practice.

3.2 Conservation Cultural Process of Architectural Rehabilitation

The intellectual practice of rehabilitation, as a cultural attitude about a significant historic place, i.e., considering buildings and people (see Chapter 2), reflects the architect's ethics, philosophies and design principles, framed by the context in which design occurs, the social, cultural, economic and, particularly in the case of interventions in public buildings, political. These influencing factors are expressed in the products of rehabilitation design, firstly in drawings and models, then on site as they are implemented. Following the previously established definitions of culture and cultural (see Chapter 2), this section establishes the definition of architectural rehabilitation as a cultural process and makes the case for the cultural rehabilitation of historic schools.

3.2.1 Conservation of Cultural Values: Cultural Conservation

At the beginning of the twentieth-century, sustainability is at the core of conservation concerns and objectives. As a result, guiding documents are being revised and embracing the

concept of in its four pillars: social, environmental, economic and cultural (UCLG, 2010), with the recent addition of the latter advocating the need for including culture in public policies.

For example, in the 1992 *Charter for the Conservation of Places of Cultural Heritage Value*, the purpose of conservation was 'to care for places of cultural heritage value' (ICOMOS New Zealand, 1992). In the recently revised version, (ICOMOS New Zealand, 2010) the following text has been added: 'to retain and reveal such values, and to support the ongoing meanings and functions of places of cultural heritage value, in the interests of present and future generations'. By acknowledging cultural heritage value as both tangible and intangible components, the charter further proposes consultation as a method to 'recognise, respect, and reveal values', accepting the possibility of co-existence of different, conflicting or competing values.

Informed by reflections on the researcher personal experience, the relevant literature on architectural conservation design principles and guidance established in international documents is now discussed, mainly focusing on international documents issued by UNESCO, ICOMOS and CoE. The discussion is illustrated with cases from English Heritage (EH) and Getty Conservation Institute (GCI), as institutions that support and pursue the protection of the cultural significance of architectural heritage. These institutions issue doctrinal documents such as charters², conventions³, declarations⁴ and recommendations.⁵ The review focuses particularly on rehabilitation interventions as heritage conservation charters advocate that buildings should be kept in use, and preferably their original use.

3.2.2 Principles, Practice and Problems

Recognising the architectural conservation theories of Riegl, Viollet-le-Duc, Ruskin and Morris in the late nineteenth century (Jokilehto, 1999), the contemporary trends in conservation theory advises an informed approach to historic buildings (Clark, 2001), and argue for the use of common sense in the decision-making based on people's values, uses and meanings (Muñoz Viñas, 2005), and refocus on the original concepts based on interventions in objects, by turning to socio-cultural objectives of culturalisation, significance and sustainability (Pereira, 2007).

2 Charters are a document, issued by a sovereign or state, outlining the conditions under which a corporation, colony, city, or other corporate body is organised, and defining its rights and privileges; provide guiding principles towards an appropriate response to particular conservation issues.

3 Conventions are subject to states' ratification; states adopt and are obliged to comply.

4 Declarations are norms and universal principles with which states are expected to comply.

5 Recommendations are invitations to apply laws on issued principles and norms.

However, as 'theory, without application, remains inert' (Matero, 2007, p. 46), an understanding of the methodologies currently in place is needed.

Review international guidance sends a clear message that 'understanding' is essential to complying with heritage conservation principles. The seminal *Venice Charter* (ICOMOS, 1964) establishes that: interventions in buildings and sites should be preceded by studies of the historical and physical context (Article 9). However, studies of the intervention context are generally not provided and are left to the architect to conduct (or not). The time given for gathering knowledge, essential for assessing existing values, informing design decisions and studying alternative solutions, is generally considered to be the same required for new buildings, and the lack of 'design time' might indicate that not all is being done to contribute to the sustainability of architectural heritage cultural significance.

Another miss-match felt between theory and practice was found in a lack of support. The *Amsterdam Charter* (Council of Europe, 1975) recommends taking an integrated approach to conservation of architectural heritage, based on administrative and technical support. Similarly, the *Granada Convention* (Council of Europe, 1985a) advises the use of a set of instruments – such as statutory protection measures, authorisation procedures and supervision of works – to prevent negative changes to protected properties. Following the *Granada Convention*, many countries have adopted these recommendations, as for example in Portugal, where planning permission from national heritage authorities is compulsory in the cases of listed heritage properties, those waiting to be listed or those included in a heritage buffer zone. However, whenever an exceptional regime is issued by the state itself, establishing that projects do not require official permission to be built, neither locally or nationally, decisions on heritage management are not informed by heritage appraisals that were expected to provide technical support.

In this context, architects are left to make their own judgments in establishing the changes to be made. As an expression of history, and therefore recognised as being 'a capital of irreplaceable spiritual, cultural, social and economic value' (Council of Europe, 1975, p. 3), the safeguarding of architectural heritage values becomes the sole responsibility of the architect. This contravenes the *Venice Charter*, which states that the 'evaluation of the importance of the elements involved and the decision as to what may be destroyed cannot rest solely on the individual in charge of the work' (Article 11 in ICOMOS, 1964). Acknowledging this responsibility was strongly felt by the researcher in the rehabilitation process of historic schools.

Theory suggests that conservation design requires a level of professional competence and expert input to contribute to maintain cultural significance. The *Krakow Charter* (ICOMOS, 2000), where principles for conservation and restoration of built heritage are set out, specifies that a competent and well educated leader is the one who can conduct an accurate study of architectural history, theory and techniques of conservation. It is clear that the importance of specific training to manage the complexity of these projects and to ensure that 'conservation work is only undertaken by, or under the supervision of, conservation professionals' (Article 14 in idem).

International documents focus on the role of communities, groups and individuals in the respect and establishment of values. This has been mostly recognised in the *Convention for the Safeguarding of the Intangible Cultural Heritage* (ICH) (UNESCO, 2003), defined as 'practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognise as part of their cultural heritage' (UNESCO, 2003). Transmitted from generation to generation, the capacity of ICH to provide a sense of identity and continuity to individuals and communities is acknowledged. The set of measures to safeguard ICH include the identification, documentation, enhancement, and transmission of ICH, recognising the importance of three actions: its safeguarding, the enhancing of heritage awareness and the handover to the younger generations. The principles are most appealing, particularly when rehabilitating education environments, where heritage awareness and the passage of cultural heritage knowledge find here the school community as the sources and the targeted individuals of several forms of ICH. In practice, the rehabilitation of an historic school seems to provide an opportunity for the dissemination of a cultural perspective and respect for past heritage, for the understanding of the heritage values of the place and for the passing from the teachers and staff's generation to the students' generation of the values shared by the school community. However, no literature was found on the cultural stewardship of heritage linked to architectural rehabilitation of historic schools, suggesting a gap between theory and practice.

Finally, the recent *Faro Framework Convention on the Value of Cultural Heritage for Society* (Council of Europe, 2005), recognises for the first time that cultural heritage entails resources inherited from the past – material heritage (buildings, groups of buildings, and sites) and immaterial heritage (evidence of the values, beliefs, knowledge and traditions of individuals and/or communities of heritage places) – and contemporary architecture, as the parties are to undertake to:

- promote cultural heritage protection as a central factor in the mutually supporting objectives of sustainable development, cultural diversity and contemporary creativity (Article 5e); and
- promote the objective of quality in contemporary additions to the environment without endangering its cultural values (Article 8d).

The document recommends the use of cultural heritage impact assessments as a mechanism to contribute to 'the processes of economic, political, social and cultural development and land use planning' (Article 8a), so that, if required, mitigation strategies be adopted. Arguing for a 'sustainable use of the cultural heritage', the *Faro Convention* considers that 'respect for the integrity of the cultural heritage' should be promoted 'by ensuring that decisions about change include an understanding of the cultural values involved' (Article 9a), the intrinsic values of the architectural heritage and the ascribed values, by the heritage community, namely their users. This brief summary of this important document for architectural conservation highlights the new paradigms of the twenty-first-century conservation practice and sets up a number of questions in this change of paradigm: how can the voice of individuals or communities be heard in conservation projects? How prepared are officials in heritage departments to appraise contemporary architecture within the historic context? What type of criteria has been established to support decisions, design and appraisal? How are architects being prepared to base decisions on cultural values? How is ICH considered in conservation design? How can 'high-quality work' be provided, as is required here? What tools are available to conduct cultural heritage impact assessments? This charter sets up a number of questions in this change of paradigm. Consequently, to properly address change, there is a necessity to know what is in need of being changed, and to understand how current architectural conservation practice actually functions. This necessity has been felt most urgently in Portugal since the *Faro Convention* entered into force in June 2011.

The discussion of these internationally recognised documents that are currently guiding architectural conservation practice, and the examples provided, have demonstrated the problems that principles and guidance have in actual practice. Conservation principles regarding the safeguarding and protection of the material values of built heritage are still used as a basic framework to guide decisions. However, the specific socio-cultural context in which each conservation process takes place, as is currently conceptualised to have a significant effect in the conservation design process and in the sustainability of architectural heritage, has gradually been included in guiding documents, and therefore needs to be addressed in policy and in practice. It can be concluded that practice knowledge is needed in theory.

3.2.3 Types of Conservation and Conservation Principles in Practice

The following table summarises the most commonly used terms to define degrees of intervention for conservation purposes in increasing degrees of intervention (see Table 3.1).

The Venice Charter (ICOMOS, 1964)	Degrees of intervention (Feilden, 2003, pp.8-12)	Conservation Processes (ICOMOS New Zealand, 2010)	Conservation Processes (ICOMOS Australia, 2013)
Conservation (maintenance)	Prevention of deterioration (or indirect conservation)		Maintenance
Conservation/Preservation (use; setting; moveable heritage)	Preservation (repairs)	Preservation (stabilisation, maintenance, repair)	Preservation (stabilisation)
Restoration/consolidation	Consolidation (or direct conservation)		
Restoration (respect all periods)	Restoration	Restoration (reassembly, reinstatement, removal)	Restoration and reconstruction
Restoration/Additions	Rehabilitation		Restoration
Restoration/Partial replacement	Reproduction		
	Reconstruction	Reconstruction	Reconstruction
		Adaptation	Adaptation/Adaptive re- use (additions, new services, changes)
			New Work

Table 3.1. Types of conservation processes, in increasing degree of interventions.

In some cases, an intervention in a heritage site may require different conservation approaches and actions (ICOMOS ISC20C, 2011). For example, in the case of *Liceu Passos Manuel* in Portugal, the authors applied several levels of intervention: restoration of the historic building, by preserving the original materials of the building, replacing the minimum fabric possible, making contemporary materials only distinguishable upon close inspection and respecting the contributions of all periods; rehabilitation strategies as new uses and new

technology were implemented in the existing building with additional floor area gained on the ground floor through the insertion of an upper level; reconstruction to replace small missing decorative elements, and rebuilding certain structures using contemporary materials alongside original finishing materials, supported by documentation and evidence; and finally integrating a new addition on the *liceu* plot, with a contemporary aesthetic expression and materials in a location and with a volume that affects the use and perception of the historic building as little as possible (Mestre and Aleixo, 2011c). Although these described interventions followed international recommendations for interventions in architectural heritage, there was no consultation or post-construction assessment to verify if the design assumptions have been wisely thought and sensibly implemented, i.e., if they had actually avoided any negative heritage impacts.

Respect

Often found in conservation literature, the word 'respect' deserves a deeper understanding. According to the OED, 'respect' has two complementary meanings: consideration of a fact or motive which assists in, or leads to, the making of a decision; and the act of looking backwards, of examining a past issue. Therefore, in this research on rehabilitation, 'respect' is defined as the consideration for the history of an historic place, including consideration for the current time, which informs and guides design principles in the establishment of design strategies. These will need to respect both past and current values. Consequently, sustainable design strategies are supported on design principles established according to recognised values. The following forms of respect have been found in the literature on architectural conservation, and a brief discussion on a selected few follows the list:

- history of place/age/patina (ICOMOS ISC20C, 2011).
- retaining cultural significance (ICOMOS Australia, 2013)
- minimum intervention in fabric (ICOMOS New Zealand, 2010, ICOMOS Australia, 2013)
- cultural diversity and human creativity (UNESCO, 2003)
- cultural diversity and heritage diversity (UNESCO, 1994)
- social and cultural values of all societies (UNESCO, 1994)
- authenticity (UNESCO, 1994)
- respect for existing use (Council of Europe, 2005)
- associations and meanings (ICOMOS Australia, 2013)
- knowledge, skills and techniques (ICOMOS Australia, 2013)
- traditional techniques and materials (ICOMOS Australia, 2013)

- retention of an appropriate setting/remain in location (ICOMOS Australia, 2013)
- contents, fixtures and objects
- participation (Council of Europe, 2005, ICOMOS Australia, 2013)
- functional and spatial layout (ICOMOS, 1964)
- integrated additions (ICOMOS, 1964)

In architectural conservation practice, the principle of minimum intervention in tangible values of historic fabric has been widely assumed; however, the current definition considers 'the minimum necessary to ensure the retention of tangible and intangible values and the continuation of uses integral to those values' (ICOMOS New Zealand, 2010).

Regarding the respect and retaining of contents, fixtures and objects, a smaller scale of elements can be found in several architectural heritage interiors and their values have been recognised in policy documents as follows: decoration of historic buildings (ICOMOS, 1964), fixtures and fittings (Council of Europe, 1985a), furnishings and decoration (ICOMOS, 2000), contents, fixtures and fittings (ICOMOS ISC20C, 2011), and contents (ICOMOS Australia, 2013). Although international principles consider the protection of movable or fixed elements in internal spaces, the lack of attention generally given to other than immovable heritage has already led to the loss of numerous identity elements, which were part of the character of places.

The use of architectural heritage has also found different approaches, including a wise use (Council of Europe, 2005), a new/most appropriate use (Council of Europe, 1991), continuing use (ICOMOS New Zealand, 2010), compatible use (ICOMOS Australia, 2013), original use, a wide range of uses and adaptive use (Feilden, 2003). The CoE encourages that historic buildings be kept useful, though it may be necessary to find new uses 'which take account of the needs of present-day life so that buildings are not allowed to fall derelict, provided the new use does not run counter to the architectural or historical significance which was the reason for their protection' (Council of Europe, 1991).

The principle that new work should be must be distinct from original (ICOMOS, 1964) and contemporary (Council of Europe, 2005) is clearly expressed in the *Madrid Document*: 'new interventions should be designed to take into account the existing character, scale, form, siting, materials, colour, patina and detailing. Careful analysis of surrounding buildings and sympathetic interpretation of their design may assist in providing appropriate design solutions. However, designing in context does not mean imitation' (ICOMOS ISC20C, 2011).

The protection of architectural heritage settings has been recognised, as the values of architectural heritage, as material cultural heritage, go beyond its form, mass and spaces. The fact that architectural heritage is contained in the wider, built or natural environment makes the protection and conservation of historic buildings a complex issue. In 2005, attention was drawn to heritage settings (ICOMOS, 2005), soon followed by UNESCO's protection of *Historic Urban Landscapes* (HUL) (UNESCO, 2005).

The approach to 'respect' stresses the social importance of cultural heritage values. International guidance strongly suggests that cultural heritage contributes to the enhancement of the quality of life and the sustainable development of societies and therefore should be conserved (Council of Europe, 2005). In the last decade, architectural conservation debate has been shifting from an understanding of conservation as a physical intervention to a growing attention to sociocultural values. The *Built Vernacular Architecture Charter* (ICOMOS, 1999) focused on people's affection and pride, establishing principles for care and protection of architecture as 'a continuing process including necessary changes and continuous adaptation as a response to social and environmental constraints'. Interestingly, the charter establishes that: 'the vernacular embraces not only the physical form and fabric of buildings, structures and spaces, but the ways in which they are used and understood, and the traditions and the intangible associations which attach to them' (idem), suggesting that for non-vernacular architecture, such as the one designed by architects, the link between use and perceptions either would not be considered or is either tacitly accepted. The importance of this charter relies on the date when it was issued, when thematic approaches to heritage were taking place, raising awareness of other built structures than just those recognised as monuments. It suggests that it was already perceived that for vernacular architecture, affection and pride played a major role in the protection of these buildings.

3.2.4 Rehabilitation

Rehabilitation, a practice 'as old as time' (Feilden, 2003, p. 277), was defined as a 'process to bring a building to a new use or function, without altering the portions of the building that are significant to its historical value' (ICOMOS, 2003), and is currently understood as a type of architectural intervention which changes or adapts existing buildings, including alteration and/or extension (ICOMOS ISC20C, 2011). This practice is advocated by UNESCO in WHC when recommending state parties 'to take the appropriate measures necessary for, among other actions, the rehabilitation of cultural and natural heritage' (Article 5, sub-paragraph d) in

UNESCO, 1972a). ICOMOS defined rehabilitation as 'modification of a resource to contemporary functional standards which may involve adaptation for new use' (ICOMOS Canada, 1983). More pragmatically, Petzet defined rehabilitation as work which 'results from the need to accommodate modern standards and provisions or to change a buildings' [use]' (2004, p. 18), further highlighting the case of rehabilitation of public buildings: '[this may involve] massive interventions that are determined by a building's function and by special requirements and that are regulated by relevant provisions and standards, including fire walls, emergency routes, new staircases, elevators, etc.' (idem, p.19).

Generally, the loss of social and cultural memory embodied in historic buildings 'would make the world less understandable' (Matero, F. in Preface of Stubbs, 2009, p. xvi), which is a significant reason to rehabilitate historic buildings. In the widely recognised work, *Conservation of Historic Buildings*, Feilden (2003) dedicated a whole chapter to rehabilitation, highlighting the advantages of this type of intervention:

'social, in that people and towns keep their identity; cultural in that artistic, architectural, archaeological and documentary values can be preserved both for their intrinsic value and their contribution to the identity of the town; economic in that (a) existing capital is used, (b) energy is saved, (c) demolition costs are avoided, and (d) the existing infrastructure of roads and services is utilized' (Feilden, 2003, p. 277).

There might be cases when a new addition may be needed to ensure the sustainability of the heritage site. Their design should 'respect the scale, siting, composition, proportion, structure, materials, texture and colour of the heritage site. These additions should be discernible as new, identifiable upon close inspection, but developed to work in harmony with the existing; complementing not competing' (ICOMOS ISC20C, 2011). Research has been conducted in contextual compatibility of additions (Groat, 1988: p. 40 in (Sanoff, 1991) showing colour photographs to experts and non-experts and a framework of three physical features categories: 'site organisation, or the patterns that a building imposes on the site; massing, or the volumetric composition of a building; and facade design, which is used to mean the surface treatment of the shell of the building' (Sanoff, 1991) p.40). The findings revealed that facade design seems to have a significant role in compatibility perception, particularly of using replication of significant design elements, mixing traditional and contemporary qualities. This research indicates that the design of additions, particularly their facades, should be analysed in order to understand the design strategies used in the infill of new buildings in historic schools settings, namely by understanding the relevance of existing traditional design, the

contemporary architectural expression and the design strategy regarding contrast or continuity through contextual design.

Sanoff (1991) considers maps to be 'an indicator of important environmental features that need to be considered when site and building modifications are proposed' (p.83). Lynch considered three components on a mental image: identity, structure and meaning (Lynch, 1973 in Sanoff, 1991, p. 130). In this author's opinion, people's ability to identify environmental characteristics, their establishment of relational patterns between spaces and the personal significance of the object or place's, create the individual's image of a place.

Rehabilitation of Historic Schools

School buildings have recognised educational and social values for past, present or future generations (English Heritage and DfES, 2005), which are 'embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects' (ICOMOS Australia, 2000). Historic school buildings have urban values, occupying historically central and visible places in cities, towns and villages (English Heritage and DfES, 2005). Some of these buildings for education now form part of our architectural heritage due to their historic and aesthetic values (Mestre and Aleixo, 2011b, Déom, 2008, Barata and Botas, 2003, Harwood, 2010, Alegre, 2012a, Burke and Grosvenor, 2008). Their significance for education heritage calls for their careful preservation and safeguarding. This is generally echoed in contemporary architectural conservation recommendations (ICOMOS, 1964, ICOMOS New Zealand, 1992, UNESCO, 1972a, Council of Europe, 1985b, Council of Europe, 1991, Council of Europe, 1994, UNESCO, 2004). English Heritage provides the following list of reasons for the preservation of historic schools (English Heritage, 2010, p. 6):

- Enhance quality of place: often in highly visible local landmarks (are a symbol of local pride, contributing to places' perception);
- School place in the community: contribute to local character and streetscape, have ethos and character, give identity and sense of educational purpose
- Sustainability: careful management of the built environment (avoid carbon impact of demolition, preserve embodied energy) an opportunity to enhance energy efficiency
- Less disruptive for students and staff (no need to move out while works are ongoing)
- Learning opportunity: enables juxtaposition of historic and modern styles in learning environments; (historic buildings can be learning resources in themselves; the 'retention of 'exemplar' rooms enables an understanding of how previous generations learned and taught in the past).

However, school buildings must now adjust to changes according to new education policies in order to ensure that learning environments are suitable for twenty-first-century education (Nair, 2001, Dudek, 2000), which will require the construction of new buildings or the adaptation of existing schools, i.e., their modification to suit the existing use or a proposed new use (ICOMOS Australia, 2000) within a design quality framework (OECD/CELE, 2009).

In the case of historic schools, EH is in favour of repair, refurbishment and reuse to replacement or, if not possible, to preserve original use or to convert to a new use, considering that there is the 'need to carefully consider the medium and long-term implications of development, not just the short-term ones' (English Heritage and DfES, 2005, p. 3). EH established a specific checklist with eight general principles for the future of historic buildings: understand what is there, understand ownership, consider the entire site, try to keep the building's original use, consider adaptation and extension rather than replacement, find another use rather than demolish, consider all implications of relocation and determine the archaeological impact. EH further issued a *Model Brief* (English Heritage, 2005) to accompany this position statement, providing guidance to determine the historical significance of schools under the BSF programme.

Historic schools have unique historic values that no new school, currently built, could ever provide, such as evidence of past architectural, aesthetic, symbolic, political, technical and social values (Jokilehto, 1999, Avrami, 2000, Feilden and Jokilehto, 1998, Feilden, 2003, Orbaşlı, 2008). These values entail the cultural significance of the place (ICOMOS Australia, 2000). Consequently, and as some are socio-cultural values, it is further suggested that the inclusion of stakeholders' perceptions of values, from owners to architects and users, in the conservation process will have an impact on the successful retaining of the cultural significance of places (ICOMOS Australia, 2000), and therefore in their sustainable conservation (Council of Europe, 2005). In addition, although there is a consensus about the benefits of keeping the same use, conservation is approached and undertaken differently from culture to culture (Avrami, Mason and de la Torre, 2000) and as a result there is a need to assess heritage values (de la Torre, 2002) after rehabilitation. This is a new attitude towards the assessment of cultural significance: an approach to actual change in cultural values.

3.3 Issues of Change in Rehabilitation

Acknowledging EH's list of a wide range of types of change, and their general acceptance, which aim to not adversely impact on cultural significance of historic buildings – renewal of elements (normally desirable), repair (normally desirable), intervention with material loss of evidential values (acceptable), restoration (acceptable), new work/alteration to significant place (acceptable) (English Heritage, 2008a, pp. 8-9) – this section discusses one type of intervention, which may include all of the above listed changes: rehabilitation. The section reviews the literature which approaches architectural heritage rehabilitation as the driver of change of historic buildings, in general, and specific of historic schools, and identifies the current debates and approaches to change.

3.3.1 Education Change in Historic Buildings

Education, the school buildings' purpose, is currently acting as the cause for physical change and for rehabilitation in the case of historic schools, with the aim of achieving socio-cultural change. This research on architectural rehabilitation effects was triggered by the physical changes that SMP was requiring historic schools to undertake, as previously explained. With regard to the 'Schools Modernisation Programme', the clear objective of the initiative was 'to modernise', so a clear understanding of the meaning of the term was needed. In *Cultural Anthropology*, 'modernisation' is a process of change defined as 'a global process of cultural and socioeconomic change whereby developing societies seek to acquire characteristics of industrially "advanced" Western societies' (Haviland, 2002, p. 450). Petzet pragmatically defines it as the 'installation of a heating system' (2004, p. 19). Both definitions illustrate the technological development observed by the end of the twentieth century, which encouraged education policies to change and, accordingly, the adaptation of school architecture. The challenge was launched for new school buildings:

'The challenge of the 21st century will be to recapture the means of expressing the significance of learning in the buildings we design, whilst absorbing the increasingly sophisticated pressures from social and technological change'(Willis, 1992, p. 10)

The decisive moment for education policies change was internationally launched in 2000 at the *European Summit in Lisbon* where education and training were considered indispensable means for promoting social cohesion, for which a paradigm shift was put forward: from

traditional transmission of knowledge (teacher centred) to the capacity of the person to learn (student centred) (European Parliament, 2000). This new philosophy of teaching and learning related to the use of new technologies (Willis, 1992) was encapsulated in the expression 'New Learning Environments' (NLE) (Dudek, 2000, Jamieson et al., 2000), as opposed to formal education environments, which needed to be changed:

'as contemporary places for teaching and learning (...) university architecture must do more than appeal aesthetically to users, passers-by or judges of architectural awards. The idea that the formal teaching and learning process "takes place" somewhere needs to be acknowledged by university administrators, facility managers and architects, educational researchers and teachers and be a primary consideration in the design of new buildings or the redevelopment of existing facilities' (Jamieson et al., 2000, p. 221).

To tackle this need, 'schools need architects' (Dudek, 2000, p. 99), as architects can give 'physical expression to the meaning of education in society through schools' (Willis, 1992, p. 10), as places which should actively support learning processes (Gislason, 2007). Conservation architects are even more needed in the case of historic schools since it has been recognised that 'in broad terms, a historic school building is unlikely to meet every modern guideline' (English Heritage, 2010, p. 10) and these professionals have the expertise to adapt to technological development, and provide buildings with access to new technologies, which are considered to be the modern motor for acquiring knowledge (Willis, 1992):

'Architects and planners must keep in touch with research and development in this field, because much will occur rapidly to overcome the present problems and allow communication and access to information – those symbols of power in the 21st century – to be available and used by all our citizens (...) We have to build the skills of adaptability to a context of permanent change into the foundations of our educational provision – and of the buildings in which it takes place' (Willis, 1992, p. 43)

Advocating adaptable school buildings, Willis further noted that already in the past, the introduction of technologies into education had been driven by political agendas 'giving a modern image to governments, developing private industries, responding to environmental issues' (idem, p.41), and school architecture again needed to respond to continuing changing needs.

Responses to this education shift started in many countries by refurbishing historic schools (see Chapter 1). Recognising historic schools as a specific building type, and considering the level of threat found in the state sector with renewal programmes, an 'adequate management of change to the buildings' (Smith, 2007, p. 2) has been argued for the case of English schools. However, barriers were identified to the creation of NLE in a traditions culture where teachers

need to be part of the change, as agents of change, and not just transmitters of cultural heritage (RIBA and CABE, 2004). It suggests that school buildings are needed since organisational cultures in education seems to take longer to change than built environments, i.e., that the school environments can more quickly affect the values and norms of a school organisation than the other way round. It has been studied how school culture (shared norms) may have an effect on school climate (shared perceptions) (Macneil, Prater and Busch, 2009), demonstrating the interrelations between schools design, educational practice, school culture, and student learning – all interrelated features of a school's learning environment (Gislason, 2010).

Meanwhile, education concepts changed again and NLE have been currently updated to Innovative Learning Environments (ILE) (OECD, 2013), suggesting the need to move forward from the question of old-new facilities to the provision of powerful and creative environments that go beyond the role of technology to approach, through innovative places, students' networking and change organisational cultures, shifting the focus from technology to people. This most recent shift was observed after the BSF and SMP initiatives, and is here referred to in order to illustrate how quickly changes occur in education at the beginning of the twenty-first-century, and how it can influence school design and the rehabilitation design of historic schools. However, even bearing in mind Willis' terrible thought – that the learning process can 'take place' anywhere – the interest in preserving the architecture heritage of education has prevailed with increasing interest in historic schools in the first decade of the twenty-first century. Nevertheless, it is not clear if the driver has been cultural, social, environmental or economic sustainability, as it seems to tackle all four. The fact is that historic schools are being refurbished or modernised, as education policy develops.

3.3.2 Rehabilitation: Changing Architecture and Cultural Values

In *Cultural Anthropology*, Haviland considers that 'culture change is characteristic of all cultures to a greater or lesser degree' (2002, p. 450), which take place either due to accident or to a deliberate intention to solve perceived problems. Whatever the cause is, this author identifies two types of consequences: adaptation and progress. In the case of architectural conservation, the change asked to be made to material cultural values, historic school buildings, aimed to solve emerging technological problems, such as use and general environmental conditions. Complying with the prerequisite of being tailored for each case and context, architectural rehabilitation is an innovative and creative source of change, as it

improves built environments by applying known design principles. However, the acceptance of physical change, of architectural rehabilitation, depends on the perception of 'superiority to the method or to the object it replaces (linked to) the prestige of the innovator and recipient groups' (idem, p. 450). Therefore, beside the provision of a changed physical environment, the acceptance of a rehabilitated historic school requires that their targeted users – the school community – accept the change as an enhanced environment for its use and recognise the architect's professional prestige alongside the aimed preservation of the place's cultural significance.

Perception and use of heritage resources has changed since the turn of the century (Araoz, 2009). Heritage is now understood as having a role in society; communities are appropriating heritage and heritage is understood as a public commodity. Therefore, EH suggested that decisions about change should be balanced and can only be justified after an understanding of 'who values the place' and 'why they do so' (English Heritage, 2008, p. 67). Participation is therefore the basis to establish places' cultural significance.

An increasing number of debates regarding conservation challenges can be found in the literature, with a focus on decision-making and multiple values, with the latter addressing the role of stakeholders and of local communities (Williams, 2010, p. 103). One of the challenges that have been debated is the concept of 'change' in the management of architectural heritage. What does 'change' mean in this context? The recent discussions have been focusing not on the effects of conservation interventions on heritage values but on the management of change. The literature review revealed that 'change' in the cultural significance of a place has been linked to words such as 'inevitable', 'necessary', 'desirable', 'cautious', 'sensitive', 'dynamic', 'reversible', 'strategic', 'appropriate', etc., and much less on the degrees of change: 'neutral', 'harmful' or (the most aimed for) 'beneficial' for cultural significance. However, considering the passage of time, it is 'inevitable' (English Heritage, 2008, p. 43) that a significant place be changed in its fabric, use, associations and/or meanings. The following sections discuss some of the concepts found to be linked to 'change' in the context of rehabilitation.

3.3.3 Managing Change

The idea of managing change in the historic environment has been set out in *Management Guidelines for World Cultural Heritage Sites* (Feilden and Jokilehto, 1998), which established that management planning should focus on heritage values as a basis for decision making, as a

basis to decide change. Managing change has been considered 'an essential part of the conservation process to maintain cultural significance, authenticity and integrity' (Art.4.1 in ICOMOS ISC20C, 2011) – the three most recognised attributes of cultural heritage in doctrinal documents on conservation. For example, to retain authenticity, EH suggests that change be distinguishable: 'The degree of distinction that is appropriate must take account of the aesthetic values of the place. In repair and restoration, a subtle difference between new and existing, comparable to that often adopted in the presentation of damaged paintings, is more likely to retain the coherence of the whole than jarring contrast' (English Heritage, 2008, p. 45). Spanish conservator Muñoz Viñas' work *Contemporary Theory of Conservation* (Muñoz Viñas, 2005) highlights the important role that people should play in conservation. The author called for common sense, for gentle decisions and sensible actions, which should be determined by the uses, values and meanings that an object has for people.

The most recent developments in the concept of change have highlighted the debate between 'tolerance for change' and 'acceptable change'. A discussion paper entitled '*Protecting Heritage Places under the New Heritage Paradigm & Defining its Tolerance for Change*' (Araoz, 2009) started a debate among heritage conservation professionals. By arguing a new approach to heritage, where values would be considered to reside on intangible concepts, in contrast to a traditional approach to material cultural values, Araoz considered the changing nature of cultural values and stated that 'values can be neither protected nor preserved'. Under this rationale, a heritage management approach which has some 'tolerance for change' (Araoz, 2009) is suggested. The proposal considered 'a new philosophy founded on fashionable heritage paradigm shifts' (Petzet, 2010, p. 4), considering that tangible and intangible are 'two sides of the same coin' (idem, p.2). Furthermore, Petzet is clearly against the idea of conservation as 'managing change', which he considers to be an Australian perspective, not a synonym of conservation which, for him, means 'preserving, not altering and destroying' (idem p. 1). This debate highlights the differences between a patrimonialist approach (Petzet) and a liberal approach (Araoz). Recalling Muñoz Viñas, conservation need a sensible approach, a cultural approach, and not extreme approaches.

Another approach to the management of architectural heritage argues for the concept of 'acceptable change', which need to have clearly established limits of change. As a method, the *Madrid Document* suggests the elaboration of a Conservation Plan, which identifies the significant elements of the site and the areas where intervention is accepted (ICOMOS ISC20C, 2011). Some limits seem to find consensus in the literature. For example, the loss of an historic building fabric that compromises the authenticity and integrity of a place, such as the retaining

of a facade alone, is not acceptable (Jokilehto, 1999, English Heritage, 2008). EH's *Conservation Principles* established accepted reasons for change, considered to be neutral to heritage values of a significant place (English Heritage, 2008, p. 10):

- a. The changes are demonstrably necessary either to make the place sustainable, or to meet an overriding public policy objective or need;
- b. There is no reasonably practicable alternative means of doing so without harm;
- c. That harm has been reduced to the minimum consistent with achieving the objective;
- d. It has been demonstrated that the predicted public benefit decisively outweighs the harm to the values of the place, considering:
 - its comparative significance,
 - the impact on that significance, and
 - the benefits to the place itself and/or the wider community or society as a whole.

Following these accepted reasons for change, the following section approaches design as the trigger to change the values of an historic context, an opportunity to contribute with the contemporary layer to the history of a place.

3.4 Design in Historic Context: creating the heritage values of tomorrow

The expression 'the creation of the heritage values of tomorrow' was borrowed from *Conservation Principles* (English Heritage, 2008, p. 58), where it is suggested that such creation has the greatest opportunity in quality interventions as 'quality is enduring, even though taste and fashion may change' (idem, p. 59). The architectural design process can be mapped by identifying a logical sequence of activities. There is a problem, generally stated in a brief, and provided by the client to a selected architect, usually based on previous work. The latter investigates the problem, gathers information and develops a solution that communicates through sketch plans to owner. These sketches develop into scheme designs for applying to project planning approval. Working drawings expand and detail the previous schemes for site communication, under the supervision of the architect. After site operations are completed, the product is finished and the feedback stage can start.

The design process of a new building and the conservation design process of an existing building, although having some particularities, follow the same sequential stages of analysis – synthesis – evaluation (Lawson, 2006). The main initial difference relies on the primary investigation on the problem. Beside the need to meet functional and spatial requirements, which may already be met within the existing fabric that is already functionally and spatially

characterised, this fabric may be in need of physical repair and technical/environmental enhancement. This requires a deep understanding of the existing building, in all of its dimensions, tangible and intangible. Arguably there is a perception that the ‘best designers are more likely to spend their time designing than writing about methodology’ (Lawson, 2006, pp. 40-1), which would indicate that knowing how good designers actually work in practice can provide better understanding than through the perspective of design methodologists (idem).

3.4.1 Rehabilitation Design Stages/Conservation Planning Methodologies

Table 3.3 below summarises the basic design strategies in the context of intervention methodologies establishing the design stages for a successful conservation design process.

Stages and assessment period	Stage 1. Product	Stage 2. Process	Stage 3. Outcome product
	When conservation action is decided	Architectural conservation design and project implementation on site	Post-conservation work (1 year)
Burra Charter Process (ICOMOS Australia, 2013) community and stakeholder engagement	Understand the place	Apply strategies to retain significance	Monitor the results
	Assess cultural significance	Prepare plan	Review plan
		Implement the Plan	
Conservation Projects (ICOMOS New Zealand, 1992) community consultation	definition of the cultural heritage value of the place	preparation of a plan which meets the conservation principles of this charter	documentation of any research, recording and conservation work
		implementation of Plan	

Table 3.2. Stages of management conservation process

The first phase is to identify the causes of damage and decay, with the diagnosis (ICOMOS, 2003) based on its physical effects on the fabric, in which case intuition and experience are essential for proper evaluation of the structural safety and the establishment of treatment measures to be adopted. It is also in this stage that an assessment of the values of the place can provide relevant information for the next stage – the design strategies.

3.4.2 Activities of Architectural Conservation Design

The main activities of architectural conservation design are developed in the following sequence:

- Survey of the setting;
- Search for best practices in design of other similar building types;
- Interpret brief and requirements;
- Identify place's values;
- Take design decisions based on principles (professional ethical principles, conservation design principles and design principles regarding the building typology/function);

Traditionally constructed buildings were designed to last, thus they were constructed using traditional materials such as earth, brick, stone and timber. Historic character could be reached 'if they survived a hundred years - through being useful to at least three generations, and gradually acquiring "age value", and even "scarcity value"' (Feilden, 2003, p. 327). Therefore, the historic value was ascribed not only by style but also by survival criteria. In the twentieth century, buildings are considered spatial, structural and environmental systems (Feilden, 2003, p. 328) that architects need to understand. New materials (iron, steel, concrete) and new systems are now used in construction. However, new materials pose new problems of behaviour and durability for their preservation. Buildings need to have electrical and mechanical installations to provide an internal environment which is considered to be suitable for the users' needs. Upgrading and renewing these installations, with a limited life of about 20-25 years, presents several challenges to conservation.

The client's design brief can be the element which indicates the need to extend the historic building or to add new built areas on-site. The description of the client's needs, expressed in different ways, either in square meters per function, or listing the number of spaces and the required use, provide the dimension of the intervention. Comparison with the built area can immediately give an idea of the possibility of preserving the existing construction mass/volume or not.

Comply Legislation/Standard Building Codes

The need for flexible and innovative approaches to the application of standard building codes in heritage conservation solutions has been recognised (ICOMOS ISC20C, 2011). Current standardised building codes (e.g. accessibility requirements, health and safety code

requirements, fire-safety requirements, seismic retrofitting, and measures to improve energy efficiency) constrain the preservation of cultural significance and force the definition of 'sacrifice areas' (Appleton, 2003), i.e., areas where the cultural values are less relevant for the cultural significance of the building. Currently, the problem of intervening in existing buildings extends to the availability of materials.

The researcher has experienced the importance of selecting materials today, which have different characteristics from the period when they were produced and applied. This is the case for finishing materials, for example painting, where traditional recipes have been replaced by industrial formulas, which have a shorter life span than traditional paints. Besides material compatibility, a practical problem in rehabilitation, in the researcher's professional practice, is the lack of, or unsuitable, maintenance provided in buildings and sites after interventions are completed. The lack of a maintenance plan, explaining how a rehabilitated building should be used, may be one of the most urgent documents to be implemented in rehabilitation practice.

Best Practices

Methodological approaches towards conservation can be found in the literature. Examples of conservation interventions which retain and enhance values are generally admired and cited as best practices examples (OECD/CELE, 2011b). In approaching a methodology towards conservation, it has been suggested that constant elements are involved within conservation projects that reflect values, although there is a lack of a habit of identifying values in the Mediterranean region (Robles, 2010), in opposition to the widespread practice in Anglo-Saxon countries (Feilden, 2003, Orbaşlı, 2008, Mason, 2002). In fact, the typological, structural, constructional, functional, aesthetic, formal, historical and symbolic values can be conservation tools for planning architectural conservation interventions and for the assessment of a project's outcome. The quality of analysis of values is therefore believed to provide information on the 'most important element is to be preserved' and 'create better decision-making processes' (Robles, 2010, p. 146). Typological value has been considered the 'most representative of all cultural and can be characterised by 'spatial, environmental and lighting conditions, with spatial and visual relationships' values' (Robles, 2010, p. 151) and helps to understand the construction process, techniques involved and original context.

A Portuguese paradigmatic example can be found in the rehabilitation of the photographic studio *Casa Carlos Relvas* (Mestre and Aleixo, 2007). The removal of alterations made ten years after the construction of the buildings, in 1886, recovered the spatial form of the

photographic studio and the decorative elements in all their splendour – particularly the glass roof and glass walls – without any re-interpretation. The original space and aesthetic could be replaced using historic photographs and close monitoring and observation of the rehabilitation works, particularly while removing the most recent materials, such as the French wallpaper, interior partitions and plaster ceilings. The original architectural typology was therefore clarified, restoring the original spaces and enabling the understanding of the function of the building. Its rarity value was enhanced with the conservation project, which now allows for visits and workshop events to take place, contributing to a sustainable use, i.e. enduring in time, with the addition of a contemporary photographic laboratory, a reception area and toilet facilities.

This intervention methodology is in line with *restauración objetiva* (objective restore) – a method established by Moreno-Navarro in Barcelona (2000). This method has four stages: to know the complexity of the monument and its setting; to reflect on the guiding principles to be applied in the intervention; the intervention in itself; and finally, continuous maintenance. Aiming to first protect the triple character of a monument – architectural, documental and significance – and second to preserve the heritage, not only of the original creator but also of the society in which it was created, time to gather knowledge and reflect on the options available is essential in architectural conservation.

3.4.3 The Ethics of Conservation in Architectural Practice

To conduct ethical and professional practice, architectural heritage conservation interventions need to be defined by architects based on international principles, guidance and recommendations, issued by UNESCO, ICOMOS and the Council of Europe. Effective compliance with these documents is expected from experienced architects, for which understanding of international standard setting instruments on the protection and conservation of architectural heritage that have been ratified by Portugal is needed to inform projects. Therefore, charters and conventions on cultural heritage protection and management will now be briefly discussed to illustrate how theory can inform practice in architectural heritage conservation, using the case study offered by SMP: the rehabilitation of historic secondary schools in Portugal. The discussion concludes with a reflection on how practice knowledge is needed in theory.

Feilden identifies a standard of ethics to be observed in conservation work: first record the condition of the building; second, preserve historic evidence; third, interventions should be minimum; fourth, respect for aesthetic, historical and physical integrity of the cultural property; and finally, fifth, intervention methods and materials need to be fully documented (Feilden, 2003, p. 6). Interventions should be reversible and not impede future access to all of the original evidence. If additions are necessary, they must be identifiable, less noticeable and harmonious in colour, tone, texture, form and scale.

The *International Union of Architects Recommendation of International Standards of Professionalism in Architectural Practice* sets out in its preamble that: 'as professionals, architects have a primary duty of care to the communities they serve. This duty prevails over their personal interest and the interests of their clients' (UIA, 2011, p. 2). Therefore, in the absence of architectural conservation principles and guidelines that consider 'real world' contexts, and conscious that 'any intervention implies decisions, selections and responsibilities' (Article 1 in ICOMOS, 2000), the ethical responsibility laid on the architects commissioned to intervene in historic schools required a clear philosophical position regarding architectural heritage conservation principles, and a previous solid experience that could benefit these interventions.

3.4.4 The Case of Rehabilitation of Historic School Buildings in England

In England, and within the context of BSF, EH considered that heritage considerations regarding the architectural and historical significance of historic schools, and the community value generally attached to schools, should play a role in the decision-making process through consultation and participation (English Heritage, 2010). Due to the national investment programme *Building Schools for the Future* (BSF) that took place in England (2004-2010), and to the predicted implications of interventions in the stock of historic schools, EH issued a position statement and a contribution to the debate. EH's policy guidance document *The future of historic school buildings* (English Heritage and DfES, 2005) recognises the need for change and aimed to guarantee that a clear understanding of the significance of this building typology was informing decisions about their future. 'Decisions about schools 'should be made on the basis of sound information about their historical significance, their contribution to the character of their neighbourhood and the value placed upon them by students, staff and the local community'. Claimed by the then Prime Minister to be 'the greatest school renewal

programme in British history' ('PM launches 'schools of the future',' 2004), it aimed to refurbish/renew and build/re-build all secondary school buildings over a 15-year period.

Following the announcement of this programme, in 2005 EH assumed that 'This will transform the appearance of many school buildings which are of considerable historic interest' (English Heritage, 2005, p. 1). The document *The Future of Historic School Buildings* (English Heritage and DfES, 2005) is a position statement that was accompanied by a *Model Brief* which provides guidance to determine the historical significance of schools (English Heritage, 2005, p. 1). Appendix 1 of the document provides a template so that information gathered in an extensive assessment can be integrated with other data and, together, informs renewal strategies. It further highlights that, after strategic decisions have been made, in the cases of refurbishment, extension or disposal of historical significance schools, an intensive assessment may be needed to further inform on interior. However, it was suggested that EH's *Model Brief* 'has not, as yet, been widely taken up' (Smith, 2007, p. 6), for it is not possible to assess its effectiveness. The following list identifies a summary of triggers for change in BSF.

- Changes in the curriculum of the English education system required, for example, the use of information technology and an inclusive environment. (English Heritage and DfES, 2005).
- School buildings are located in cultural and visible places in urban clusters, either villages, towns or cities. (English Heritage and DfES, 2005).
- Community identity and cohesion are feelings supported by a shared experience that these historic places of education represent, across several generations (English Heritage and DfES, 2005). Similarly, historic schools are part of local identity and local character. Complementary, secondary uses as life-long learning and sports activities make these places to act as social hubs for communities.

In the case of school buildings, English Heritage provides the following list of reasons:

- Enhance quality of place: often highly visible local landmarks - symbols of local pride, contribute to places' perception.
- School place in the community: contribute to local character and streetscape, have ethos and character, give identity and sense of educational purpose.
- Sustainability: careful management of the built environment (avoid carbon impact of demolition, preserve embodied energy), enhance energy efficiency.
- Less disruptive for students and staff (no need to move out while works are ongoing).
- Learning opportunity: enables juxtaposition of historic and modern styles in learning environments; historic buildings can be learning resources in themselves – 'retention of 'exemplar' rooms enables an understanding of how previous generations learned and taught in the past' (English Heritage, 2010, p. 6).

EH is in favour of repair, refurbishment and reuse rather than replacement, or, if the original use cannot be preserved, conversion to a new use. As well as the impact of development, there is the 'need to carefully consider the medium and long-term implications of development, not just the short-term ones' (English Heritage and DfES, 2005, p. 3). EH

established a checklist with eight general principles for the future of historic buildings: understand what is there, understand ownership, consider the entire site, try to keep the buildings original use, consider adaptation and extension rather than replacement, find another use rather than demolish, consider all implications of relocation and determine the archaeological impact. Additional considerations for listed buildings include alteration (interior and/or exterior), extension (sympathetic proposals to the building's architectural and historical interest), demolition (preferable to convert to other use) and impact on setting (ruled by the original building). Within conservation areas it may occur that the spaces between buildings play a role as important as the buildings themselves. Although in most cases, less sensitive parts of a site can be identified for extensions and new buildings, the infilling of the whole of a school site at a very high density can have a negative impact on the character of the conservation area (English Heritage and DfES, 2005).

3.5 Assessing Rehabilitation Effects

It is generally accepted that architectural conservation produces a change on the material values of a place to evidently different degrees according to the degree of intervention. This research is focussed only on architectural rehabilitation, where the architectural heritage is adapted and extensions or additions contribute to minimise the effect on existing values while responding to contemporary needs and use requirements. The research is also focussed on assessing the social effects of environment change, which are perceived to change with time.

Monitoring and evaluating the effects of architectural heritage rehabilitation is increasingly viewed as being necessary for heritage management. Knowing the results of rehabilitation interventions can contribute to improving management effectiveness in achieving specific objectives, make results accountable and therefore inform policy, and improve architectural conservation practice by reflecting on results, reviewing methodologies and applying lessons learned. This section examines the tools available to assess the results of interventions in architectural heritage, focusing on cultural values.

3.5.1 Impact Assessment and Outcomes Evaluation

The SAGE Encyclopaedia of Social Science Research Methods (Patton, 2004), clarifies the differences between effect and impact, when referring to assessments. An 'impact assessment' considers the long-term effects of an intervention on a community, with regards to some phenomenon of interest, bringing a 'broad and holistic perspective to evaluation', where the overall question 'were outcomes sustained or increased over the long term, and what ripple effects, if any, occurred in the larger context (e.g., community)?' can be answered (Patton, 2004, p. 474). The distinction of 'outcomes evaluation' and 'impact assessment' is therefore clearly linked to time and scope, as the author explains:

'Outcomes evaluation assesses the direct linkage between and intervention and participant changes like increased knowledge, competencies, and skills, or changed attitudes and behaviours. In contrast, impact assessment examines the extent to which those outcomes are maintained and sustained for the long term. (...) Outcomes evaluation looks at the narrow, specific, and direct linkage between the intervention and the outcome. Impact assessment looks more broadly for ripple effects, unintended consequences, side effects and contextual effects' (Patton, 2004, p. 475).

Methodologically, the specific and shorter perspectives of an outcomes evaluation create several challenges, to assess input, intervention, outputs and outcomes, requiring multiple methods, deductive and inductive, including to establish causal connections between interventions and effects. Nevertheless, both are required to be systematic and follow rational guidelines.

Assessments to identify outcomes should take place when they are most important: in a pre-intervention stage, to inform decision-making, during interventions to immediately act and modify actions, and at a post-interventions stage to learn lessons, informing mitigation measures, adjustment of project strategies and avoid a long-term negative impact.

3.5.2 Evaluations in/of Historic Buildings

To develop evidence-based research for architectural heritage conservation effects, the assessment needs to understand what impact and outcome assessment tools and evaluation criteria are currently used and available. The literature was searched to identify relevant evaluation processes and criteria currently used according to types of impact evaluation found in the following three areas: process evaluation, impact assessment and post-occupation evaluation. This research focus on heritage sustainability for which the sustainability of heritage values is the aim of an assessment, and therefore the discussion of the following tools

have the purpose to identify criteria that can be transferred to an evaluation of change of material values and immaterial values.

Process evaluation

This type of evaluation assesses process stages as the causes of effects, with the aim to find successful strategies. Tools were found in design processes and an example was found in management effectiveness on protected areas. Guidance for assessing management effectiveness have been developed in the form of a toolkit (UNESCO - World Heritage Centre, 2008) for governments, international bodies and the conservation community. The action of assessing is suggested as an activity for a reflection on conservation experiences. The IUCN World Commission on Protected Areas (WCPA) *Framework for Assessing Management Effectiveness on Protected Areas* identifies a process with six stages: establishing the context of existing values and threats, planning, allocation of resources (inputs), the result of management actions (process), goods and services eventually produced (outputs), and finally, resulting impacts or outcomes. In this framework, the outcomes should evaluate the impact on pre-existing core values. However, it is considered that 'outcomes can also be the most difficult element to measure accurately' (UNESCO - World Heritage Centre, 2008, p. 9).

Impact Assessment (IA)

This type of assessment aims to predict effects of strategies in order to mitigate predicted negative effects before the process takes effective action. In the case of architecture, assessments are made prior to works commencing. Impact prediction is a technical exercise, as assessments are based on established criteria so that authorities can predict impact and practitioners can have some guidance for design decisions. Assessments to identify impact should take place when they are important: in a pre-intervention stage, to inform decision-making, during interventions to immediately act and modify actions, and at a post-interventions stage to learn lessons. The identification of impact requires a logical and systematic approach. Different types of impact can be identified, such as direct, indirect and cumulative. A scale, or descriptive comments on the predicted potential size and characteristics of impacts, should be used.

IA is the process of identifying the future consequences of a current or proposed action, which relies on a group of tools, typically based on the physical and natural sciences, and social sciences, in order to predict future expected consequences of possible decisions. IA was fully recognised in 1992 at the *United Nations Conference on Environment and Development*, held in

Rio de Janeiro. Principle 17 of the *Rio Declaration* states: 'Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature' Principle 17 of the Final Declaration is dedicated to EIA: 'Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority'.

Environmental Impact Assessment (EIA) is considered to be 'the oldest, most well-established aspect of IA' (Jesus, 2009). This type of assessment primarily focuses on the natural or biophysical environment, such as effects of interventions on air and water quality, flora and fauna, noise levels, climate and hydrological systems. Environmental quality assessment is based on qualitative criteria, which require interpretation. Some of the impact identification techniques have built in scales or weightings (and hence values) based on prior experience. In their application, the criteria should be adapted to take into account local value systems and traditional practices. The characteristics of environmental impacts vary, and there are typical parameters to be taken into account in impact prediction and decision-making. The most widely known work in EIA is 'Methods of environmental impact assessment' (Morris and Therivel, 2001), and further research informed about objectives and tools (Bond et al., 2004, Wilkins, 2003, Environment Agency, 2002).

Impact assessment is a wide area of research. One study identified 38 areas of impact assessment, other than Health IA (Alan Bond et al., 2015). With the public involvement in the EIA processes, new types of impact assessments arise, such as on social, health and economic impacts. For example, Strategic Environmental Assessment (SEA) is an impact assessment process that aims to ensure the sustainability of strategic decisions regarding environmental, social, economic, and health issues.

Social Impact Assessment (SIA)

'Social Impact Assessment includes the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment' (Vanclay, 2003, p. 5)'. Besides, *Guidelines for the Establishment of Cultural Significance*, established in 1984 and revised in 1988, it has already been considered that 'social value embraces the qualities for which a place has become a focus

of spiritual, political, national or other cultural sentiment to a majority or minority group' (ICOMOS Australia, 2000, p. 17)

Cultural Impact Assessment (CIA)

Research has been conducted on CIA in reaction to the finding that in EIA, cultural heritage impact assessments address attributes individually rather than considering the overall group of attributes, such as buildings, views, and archaeological sites (Vakhitova, Guthrie and Roders, 2011, Vakhitova, 2010). It has been claimed that cultural impacts are the most difficult to deal with since they are the hardest to evaluate and define, as cultural change takes the longest time to happen. Research linking cultural heritage and EIA (Bond et al., 2004), Cultural Heritage, IA and the Council of Europe Conventions (Jesus, 2008), and on EIA and Cultural heritage (Caninas, 1995) illustrate the interest in this field.

Heritage Impact Assessment (HIA)

In cultural heritage, it has been long recognised that 'sensitivity to change of every attribute and value must be analysed and its significance accounted for' (ICOMOS ISC20C, 2011). Responding to this need, ICOMOS developed a framework for Heritage Impact Assessments for Cultural World Heritage Properties (HIA) (ICOMOS, 2011) to evaluate the impacts of proposed changes. The overall aim of HIA is to eliminate or mitigate (avoid, reduce, compensate) adverse impacts on significant places, by balancing the public benefit of the proposed change against the harm to a place. For this, it is considered who benefits from change and for what reasons. The tool sets out principles and options and proposes a methodology to evaluate the impact of potential development on the attributes of OUV of heritage assets, considering that the protection of attributes that convey OUV sustain OUV.

HIA needs to be 'fit-for-purpose', adapted to the heritage property, to the changes proposed and to the local context. The HIA process starts with the Statement of Significance (a tool included for the first time in the 2005 Operational Guidelines, which has become operational since 2007), where attributes that reflect OUV and the connections between them should be clearly stated, and with the examination of integrity and authenticity. Criteria for defining the value of an asset range from very high to negligible, or to unknown potential. A sequence of assessments then takes place, using a variety of existing tools, with the aim being to quantify the magnitude of the impact on the built heritage, using the descriptors: major, moderate, minor, negligible, no change.

Considering impact as a consequence of an intervention, there can be two types of consequences of the proposed intervention: direct impact and/or indirect impact. The direct

impact of proposals refers to the 'primary consequences': physical loss of attribute and/or changes to its setting, local context, permanent and irreversible, confined within the development footprint; scale and magnitude depend on: proportion of the attribute affected, whether it is key characteristic, or relation to OUV is affected; impacts on setting: visual and noise. On the other hand, indirect impact refers to 'secondary consequences': physical loss of attribute and/or changes to its setting beyond the development footprint (ICOMOS, 2011, pp. 8-9).

HIA considers that potential impacts are as diverse as heritage properties, and examples of adverse impacts may be 'appearance, skyline and key views' (p.1). Furthermore it recognises that the skills required to conduct a HIA are found in a limited number of people, for it is a very specialised tool. However, this assessment is focused only on the impact of change on attributes and not on 'heritage receptors', for which it does not provide a holistic result on the effects of architectural conservation on cultural values. ICOMOS considers the lack of tools to identify receptors and to assess impact, as well as the need for HIA best practices examples. Other research has been conducted in Heritage Impact Assessments (Roders and van Oers, 2012, Roders and Oers, 2013).

3.5.3 Post-Occupancy Evaluations

Among the several studies conducted in Post-Occupancy Evaluations (POE) based on buildings performance (Thomson, 2006, Scottish Executive, 2006, Bordass et al., 2001, Preiser, Rabinowitz and White, 1988, Ornstein and Moreira, 2008, Ornstein, 1997, Watson, 2005, Watson, 2004), the work of Preiser *et al.* (1988), namely on building evaluation (Preiser, 1989), should be highlighted. Research on buildings performance assessment was conducted by Bordass (2003, Bordass et al., 2001). Literature on assessing the conservation effect on cultural significance at a post-intervention stage was not, at the moment, found. However, the literature review found support for a view in which 'architectural practice have a need to deal with intangible aspects of building performance' (Penn, 2008), such as perceptions and senses.

3.5.4 Assessment of/in Schools

To justify the need of conservation of historic schools, research conducted by OECD-Centre for Effective Learning Environments (CELE, formerly PEB) has focused on the evaluation of educational facilities quality (OECD/PEB, 2006), while other studies focused on the correlation between the learning environments and students achievement (Higgins et al., 2005). However,

in the case of interventions in historic schools, the results of assessments is still limited to the publication of examples of best practice (OECD/CELE, 2011b), which only consider material results of interventions.

Assessment tools used in schools focus mainly on understanding physical effects on historic buildings materials and structures, or on environmental conditions, such as acoustics and temperature. For example, in evaluation of quality on schools design (Thomson, 2006, Scottish Executive, 2006, Bordass et al., 2001, Preiser, Rabinowitz and White, 1988, Ornstein et al., 2009, Ornstein and Moreira, 2008, Ornstein, 1997, Watson, 2005, Watson, 2004). Design quality in schools has been a recent concern in Europe, where major changes to school buildings have been taking place. For example, in the UK, CABE developed Design Quality Indicators (DQI) as a tool to inform the design stage and to assess the success of new construction and/or refurbished schools (CABE, 2005). It establishes three evaluation areas, entailing ten criteria that can be applied to *liceu* buildings and their grounds: functionality (access, space, uses), build quality (performance, engineering services, construction) and impact (the school in its community, within the community, form and materials, and character and innovation).

According to CABE, therefore within the built environment context, 'impact' means 'a building's ability to delight, to intrigue, to create a sense of place, and uplift the local community and environment,' (2005, p. 60) for which, CABE considers, the design contribution to the art and science of building and architecture must be considered. CABE established Design Quality Assessment (DQA) criteria for the evaluation of the overall quality of the school environment, not considering brief compliance, based on ten design features, so that the standard of design evident in the material submitted can be evaluated as being very good, pass, unsatisfactory, or poor quality.

1. Identity and context: making a school that the students and community can be proud of
2. Site plan: making best use of the site
3. School grounds: making assets of the outdoor spaces
4. Organisation: creating a clear diagram for the buildings
5. Buildings: making form, massing and appearance work together
6. Interiors: creating excellent spaces for teaching and learning
7. Resources: deploying convincing environmental strategies
8. Feeling safe: creating a secure and welcoming place
9. Long life, loose fit: creating a school that can adapt and evolve
10. Successful whole: making a design that works in the round

3.6 Summary and Chapter Conclusions

Historic school buildings are an architectural heritage to be safeguarded and protected for their social and cultural significance for communities, local, national and European. In architectural heritage rehabilitation, change is an inevitable process in which an historic building, with cultural material and immaterial values, is changed at three levels: the existing architecture, the existing cultural values and the existing school culture, although the latter is perceived to take longer to achieve. The management of change in historic schools should be undertaken under a cautious approach to heritage change, fulfilling educational and well-being purposes while changing the existing material values as little as possible. Changing heritage through rehabilitation must meet certain guidelines and is managed under a set of conservation principles, synthesised in the following Table 3.3.

Purpose of Change	Managing Physical Change
- to adapt to the activity to be performed in it	- degree: aim for the minimum possible
- to provide the inherent environment required for the activity	- aim for reversibility
- to enhance socio-cultural values	- material effect: on authenticity and integrity of the historic fabric, the functional-spatial layout, constructive system, materials
- to preserve heritage values	- perception effect: on senses, feelings, meanings, associations, memories

Table 3.3. Architectural heritage rehabilitation change: purpose and managing results.

Existing evaluation tools have been discussed in this chapter alongside their inherent processes of data collection and data analysis that will contribute to the development of the research evaluation tool for the case of evaluating rehabilitation effects on the cultural significance of historic schools. The availability of tools to predict the impact of architectural interventions in historic buildings, and to evaluate the actual effect of physical interventions at a post-construction stage, emerged from the literature review. However, the lack of a tool which evaluates actual effects on cultural material values and cultural immaterial values also became apparent.

This chapter has demonstrated the need to develop a tool that can holistically assist architects in architectural conservation practice in three stages of a design process. Firstly, to understand significance through the understanding of heritage values. Secondly, to establish design principles and design strategies which preserve and enhance cultural values of historic buildings. Finally, to evaluate actual material and immaterial effects of physical change on cultural values after interventions, in order to enhance architectural decisions in the future and to contribute to heritage conservation policy. The next chapter discusses the research context where the tool will be tested: the rehabilitation of historic schools in Portugal.

The following framework (see Table 3.4) summarises the findings from the literature review, and is informed by the researcher's practice experience. This framework will inform the design of a tool to evaluate the effects of architectural conservation on heritage values.

Propose change design	Express past and contemporary values					
	Socio-Cultural context (aesthetic, political, economic)		Use		Public Facility	
	Respect for past and present generations					
Respectful design principles to be expressed by architecture	Culturally Informed: understand original design and developments significance	Culturally Informed: understand brief, rehabilitation experience, participation	Preserve authenticity and integrity of period and use	Add new fabric, new spaces, update comfort levels Comply with building regulations	Preserve public image	Enhance public image
Respectful design strategies to be used in architecture to reflect design principles	Minimal change: research, assess physical condition	Ethical intervention: research, assess current significance	Minimal change: preserve historic style, form, constructive system, materials, spatial-functional layout, contents	Build with contemporary style, constructive system, materials, adapt historic spatial-functional layout to modern curriculum	Minimal change: preserve urban setting, siting, main facade, public realm views	Improve visibility, accessibility, inclusiveness, enable community use; organise outdoor spaces
Cultural Production	Original Design	Contemporary design	Original Design	Contemporary design	Original Design	Contemporary design

Table 3.4. A conceptual framework for the evaluation of change.

Chapter Four. Portuguese Historic Schools *Liceus* and the Rehabilitation Context

4.1 Introduction

This last literature review chapter concludes Research Objective 1 by discussing the research context where the cultural values of architectural heritage are assumed to have changed with the effects of recent architectural interventions of rehabilitation. Section 4.2 presents a historical review of Portugal's national secondary school architecture, with emphasis on the *liceus* tradition in Portugal. Section 4.3 discusses the national protection policy for built heritage of education with a focus on historic *liceus*. Following this contextual framework, Section 4.4 explains the need to change school environments and the SMP programme designed by the Government to address this need. Section 4.5 discusses current issues in architectural conservation practice in Portugal. Section 4.6 ends the chapter with a summary of the key findings and conclusions.

4.2 Portuguese School Architecture: Historic *Liceus*

This section briefly explains what a *liceu* building is and what it means, addressing the development of *liceus* in Portugal up to the beginning of the twenty-first century. This historical overview provides a context within which to understand the historic character of *liceus*.

4.2.1 Origin of *Liceu*

Plato, a defender of public education, founded in 388/7 B.C. the *Akademia* or *Hekademeia* in the suburbs of Athens, with gymnasiums and *palestras* buildings where young boys, aged 11-18 (Lexis, 1977) would come to practice their exercises, play the flute or talk about philosophical or political topics. Some authors consider the Plato School the first to unify all the characteristics of a school: sharing new knowledge, teaching an organised group of knowledge, a specific urban space for teaching, and having regulations in place whereby the

school would continue following the death of its founder. Teaching took place in the gymnasium and in the outdoor gardens. Aristotle's school, named Lyceum, was founded 52 years after Plato's Academy, in the forest dedicated to Apolo Lykeios, again in Athenian suburbia. Lyceum is a Latin term that derives from the ancient Greek *Λύκειον*, *Lukeion*. According to the OED, it meant 'school' in classical Athens. Aristotle founded his Lyceum in 335 B.C., where he would walk around the covered colonnade walkway, the *peripatos* and the patio while lecturing. The school was centred on a 'grove or gymnasium dedicated to *Apollo Lyceus*' (Blackburn, 2008), where physical exercise and inductive and empirical philosophical debate took place. The lyceum had a library, laboratories, conference rooms and some residential accommodation. It is said to have been closed in 529 A.D.

Throughout the nineteen and twentieth centuries, the word *lyceum* was adopted in some European countries to name public institutions providing secondary school education and, by extension, the facilities where such education was being provided. The retrieval of the term can be traced in France, when Napoleon Bonaparte's educational reforms established the first masculine institution *lycée* (from the Old French *lyceum*) in 1802 (Savoie, 2007, Marques, 2003), for students aged 11 to 18, and soon after in 1808 when an Imperial Decree extended the designation to public secondary education facilities (Monteiro, 1971). It is believed that the name of the main secondary school establishments spread from France to many countries influenced by its culture. Examples are the UK and Estonia (*lyceum*), Italy and Spain (Liceo), Greece (*Λύκειο*), Romania and Portugal (*liceu*). Other countries, such as Germany and the Netherlands, use the term 'gymnasium'.

In summary, the Latin term *lyceum* is still used in European countries to refer to educational buildings and is still mainly used to refer to schools, both buildings and institutions, which prepare students to progress to higher studies. In the present research, the term *liceu* refers to the public school buildings built for the purpose of providing *liceal education*, i.e., secondary education, in Portugal between 1882 and 1978 under state responsibility (Nóvoa and Santa-Clara, 2003, Alegre, 2012a).

4.2.2 Historic *Liceus*: Brief Description of the Period 1836 – 1952

In Portugal, public education was proclaimed soon after the 1820 Liberal Revolution, inspired by the French Revolution ideals of liberty, equality and fraternity (Beja et al., 1990). This was the period of recognition of equal rights, new cultural values and individual freedom of religion granted with the consequent extinction of religious orders and the sale of national assets

(Custódio, 1993). It is in this context that the *liceal* education was created in 1836 by *Passos Manuel*, under state supervision (Ó, 2009, Alegre, 2011, Nóvoa and Santa-Clara, 2003). This educational reform began the Portuguese legacy of *liceus* buildings, with the decision that each of the eighteen capital districts would have a national *liceu*. However, the lack of financial resources and the number of available buildings left empty by the expulsion of the Jesuits and ready to be occupied, both private (palaces) and ecclesiastical (convents), delayed the beginning of the construction of purposely designed *liceus* (Cabeças, 2003).

In 1895, Jaime Moniz set out an education reform, a pedagogic idea centred on the 'class regime' (Nóvoa and Santa-Clara, 2003), continuing a traditional teacher-centred learning process, which organised the plan of studies horizontally, linking disciplines in a consecutive and graded manner.⁶ By 1895, only two *liceus* had been purposely-built for liceal education, in the cities of Aveiro (1860) and Leiria (1894) (Nóvoa and Santa-Clara, 2003). The 1895 Education Reform, and a later Reform by *Eduardo José Coelho* in 1905, established the basis for the design of purpose-built *liceus* (Alegre, 2012a). In 1905, the teaching of natural sciences and modern languages based on practice and experiment was considered 'indispensable to the modern life of a colonial nation' (Valente, 1973, p. 75). Consequently, spaces such as specialised rooms for sciences and humanities, gymnasiums and outdoor areas for physical exercise, were now required in *liceus* buildings. Furthermore, hygiene and sanitary concerns were reflected in the design standards and regulations in order to provide healthy educational environments.

The Constitutional Monarchy (1820-1910), which commissioned the design of the first six *liceus* buildings, was followed by the democratic 1st Republic, which lasted until 1926 when a military *coup d'état* established a military dictatorship – a period when four *liceus* were designed. Soon after this, a new constitution was established in 1933 under the *Estado Novo* Dictatorship Regime, which ruled Portugal until 1974. Under this political regime, 13 *liceus* were designed by 1950. Therefore, 23 *liceus* buildings were completed between 1909 and 1952 (see table 4.1). The inauguration dates displayed in Table 6.1 demonstrate that the time of continuous use of each facility designed in the first half of the twentieth century (until 2007) ranges from 60 to more than 100 years which, according to Feilden, makes them historic buildings: 'If it has survived the hazard of 100 years of usefulness, it has a good claim to be called historic' (Feilden, 2003, p. 1).

⁶ This regime, with recognised significance for the history of secondary education, is still in place today.

Liceu	Location	Inauguration
Liceu Passos Manuel	Lisbon	1911
Liceu Camões	Lisbon	1909
Liceu Pedro Nunes	Lisbon	1911
Liceu Maria Amália Vaz de Carvalho	Lisbon	1934
Liceu Alexandre Herculano	Oporto	1934
Liceu Rodrigues de Freitas	Oporto	1932
Liceu D. Filipa de Lencastre	Lisbon	1937
Liceu Fialho de Almeida	Beja	1936
Liceu Latino Coelho	Lamego	1936
Liceu D. João III	Coimbra	1940
Liceu Sá da Bandeira	Santarém	1943
Liceu Nun'Álvares	Castelo Branco	1946
Liceu de Gonçalo Velho	Viana do Castelo	1946
Liceu Alves Martins	Viseu	1948
Liceu João de Deus	Faro	1948
Liceu da Infanta D. Maria	Coimbra	1948
Liceu Gil Vicente	Lisbon	1949
Liceu Bocage	Setúbal	1949
Liceu D. João de Castro	Lisbon	1949
Liceu Carolina Michaelis	Oporto	1951
Liceu José Estevão	Aveiro	1952
Liceu Eça de Queiroz	Póvoa do Varzim	1952
Liceu Sebastião e Silva	Oeiras	1952

Table 4.1. *Liceus* designed and built in the first half of the twentieth century in Portugal.

4.2.3 Brief Description of *liceus* in the Second Half of the Twentieth Century

In 1947-48, the Statutes of Secondary Education established two educational options (one *liceal*, one technical) based on the differentiation of education curriculums and on the social background of students. Whilst the first gave access to higher education, and was mainly attended by students from the higher social classes, thereby giving *liceus* an elitist character, the second established courses on public services, industry, arts and female education, and were attended by students from lower income families.

Following what was observed in many other European Countries (Burke and Grosvenor, 2008) in the decade that followed the Second World War, there was a demographic 'boom' and the number of secondary students doubled, reaching about 1,000 students per *liceu* (Manique da Silva, 2002), resulting in a 'school explosion' (Nóvoa and Santa-Clara, 2003, p. 11), and a need to quickly build schools to accommodate an increasing number of students.⁷ Two to three daily shifts were introduced in the schooling schedules, which required continuous and more intense use of *liceus* buildings. As a general response, the state launched the '1958 Plan' for

⁷ This expression refers to the expansion of the school network in the 1950s and 1960s. Therefore, in Portugal, the post-war schools were not built as a reaction to the destruction of educational buildings, as it happened in several European countries, such as in England and Wales.

liceus, predicting the design and construction of sixteen new *liceus*. The development of a modular design, using the pavilion model and pre-fabricated materials, enabled the rapid and economical construction of a large number of project-type schools (OECD/CELE, 2011a). In 1964, compulsory education was expanded from four to six years, and *liceus* built after 1968, included in the third plan for secondary education facilities implemented in Portugal, were characterised by the massive construction of secondary schools in a period of 'education densification' (Veloso et al., 2011, p. 76), with an increased number of secondary education students. As a result, in the second half of the twentieth century, 30 *liceus* were built, most of them using standardised solutions that were typical of state initiatives (Matos, 1986, Alegre, 2012a).

Following the 1974 Democratic Revolution, secondary schools were created, and the previously existing *liceal* and technical secondary education were merged into a unified system to reflect the new government policy of equal access to public education. As a consequence, *liceus*, as public education institutions, were abolished by Law in 1978, and replaced by secondary education institutions and facilities. After this year, the terms '*liceus*' and 'technical schools' were officially replaced by the term 'secondary schools'.

The pavilions strategy used firstly in the 1960s was applied later in the 1980s when the 1986 Education Reform further expanded compulsory education to nine years. This was another period when there was a lack of schools, when the existing buildings were not sufficient to accommodate all the students that were now aiming for a secondary level education.

In summary, with the increased number of students since their original construction, new spaces were needed. Each school institution solved the problem in a different way. Firstly, buildings were extended, upwards, underground, or out to the sides according to the possibilities of the buildings. Secondly, and later, temporary pavilions were placed in the outdoor areas, either in sports pitches or in a courtyard.

4.2.4 *Liceu*: Current Significance in the Portuguese Context

Until the late nineteenth century, the *liceus* mostly concerned the education of the elite and conferred an important role on cities (Savoie, 2003). Access to the few existing *liceus*, located in the major cities, was a primary selection factor, limiting and restricting young people, as they would have to come to the city to be educated. This selection continued, in Portugal and in other countries. For example, in France, the *lycée* was said to remain until the 1930s as a

'machine to produce or reproduce the nation elites', as only 4% of French males would finish with a qualification (Hubert, 2005). In Portugal, the context was very similar, with increased control by the dictatorship to access to liceal education, and technical and professional education strongly advocated as an alternative for the majority of young students.

This historic and educational significance attached to *liceus*, as elitist places of education, was emphasised by the architecture itself. Since the construction of the first built-for-purpose *liceu*, a monumental character was given to the buildings, framed by a large surrounding area where the buildings would be visible and admired. In the dictatorship period, which is still alive in current people's memories, the architecture was used to stress that elitist character, not just in schools, but in all public works. For example, the use of architecture as a political instrument has been emphasised by research on Portuguese *Pousadas* (Inns) (Lobo, 2007), where aesthetic ideas of the regime were used in symbolic national projects. The allegedly national character of the architecture was made in Portugal after 1933, followed models established according to buildings types, created in the offices of the Public Works Ministries, where easy formal codes were designed to be adopted by constructors all over the country. This strategy to standardise architecture spread all over the country until the 1950s.

4.3 Heritage Protection Policy of Liceus

The purpose of this section is to examine the importance given by the state to *liceus*, as architectural heritage to be protected and safeguarded, since Portugal has signed four European Conventions: Granada (Council of Europe, 1985a), Valetta (Council of Europe, 1992), Florence (ICOMOS, 1982) and Faro (Council of Europe, 2005). However, the Council of Europe recommendations about cultural heritage have not been incorporated in national legislation or reflected in policy, such as the Rec (1991) 13 on twentieth-century architectural heritage (Council of Europe, 1991).

4.3.1 Heritage Protection: Listing Criteria

Heritage legislation in Portugal is based on the *Granada Convention* (Council of Europe, 1985a) categories of Monuments (buildings/structures), Groups of buildings and Sites (cultural

landscapes), and levels of protection are established in national law.⁸ Monuments are included in the Immovable Heritage Inventory, and Public or Municipal Interest Properties are included in the Heritage Database. In this last database, 77% of the properties are owned by the state, 3% by communities and 20% were private. To have an idea of the amount of buildings protected by national Law, the following Table 4.2 displays data from 2012. Note that the protection to Nacional Monuments requires that interventions permits are issued by central administration.

Level of protection	Number of items (2012)	Regulatory advice provided by:
National Monument	792	General Directorate of Cultural Heritage
Public Interest	2376	Regional Directorate of Culture
Municipal Interest	467	Municipalities

Table 4.2. Portugal in HEREIN System (at <http://www.herein-system.eu>, 21 Oct.2014)

Architectural heritage that is considered not to have a national value, are sent to Municipalities which, since 2010, have three levels of listing local buildings with value (see Table 4.3). These buildings, previously generally named as of 'Municipal Value', are included in Municipality Master Plans which establish the local heritage to be protected.

Category (Law n.o 13/1985)	Category (Law n.o 107/2001)
Nacional Monument (MN)	Nacional Monument (MN)
Public Interest Property (IIP)	Regional Interest Property
Municipal Value (IVC)	Municipal Value Property
	Inventory Property

Table 4.3. Immoveable listed assets: changes in Value Categories, in (IGESPAR, 2010)

⁸ Law-Decree 107/2001, of 8 Setember, and Law-Decree 309/2009, of 23 October.

The 2001 the Cultural Heritage Law defines 'cultural heritage assets' as those which are testimonies of civilization or cultural value, carrying relevant cultural interest, namely historic, paleontological, archaeological, architectural, linguistic, documental, artistic, ethnographic, scientific, social, industrial or technical, and which reflect values of memory, antiquity, authenticity, originality, rarity, singularity or exemplarity.⁹ Protection mechanisms for designated properties are established. A designated national monument has a protection zone of 50m, within which any intervention need to be designed and signed by experts with recognised training, and heritage permits are required in this area to any construction/modification (Stubbs, 2009).

The protection, conservation and enhancement of heritage sites is included in general planning policies by regulations established by law¹⁰ for different activities: demolition, new constructions, changes in volume and changes in appearance. Interventions in any of these properties are made by the owner and require a permit, while conservation work is overseen by heritage professionals and/or government technicians.

At national level, IGESPAR is the public service responsible for managing built heritage¹¹, establishing criteria for heritage listing in the Heritage Law no. 107/2001, 8 September (Article 17) as following:

- a) The matrix character of the asset;
 - b) The genius of its creator;
 - c) The asset interest as a symbolic or religious witness;
 - d) The asset interest as a remarkable testimony of experiences or historical facts;
 - e) The aesthetic, technical or material intrinsic values of the asset;
 - f) The architectural, urban and landscape design;
 - g) The extension of the asset and that it is reflected in the asset regarding the collective memory;
 - h) The historical or scientific research importance of the asset;
 - i) The circumstances which might involve decrease or loss of continuity or integrity of the asset
- other: antiquity, authenticity, originality, rarity, singularity.

Initiatives to raise public awareness of heritage are limited to a weekly radio programme and annual participation in the European Heritage days (September) and in the International Day of

⁹ Cultural Heritage Law: policies, protection and enhancement: Lei n.º 107/2001, 8 September, Art2.

¹⁰ Law-Decree 107/2001, of 8 September, and Law-Decree 309/2009, of 23 October.

¹¹ In 2010, <http://www.ippar.pt>; in 2011 <http://www.igespar.pt>; 15 September 2011 Directorate-General for Cultural Heritage (DGPC). In 20 June 2014, the website changed to <http://www.patrimoniocultural.pt>

Monuments and Sites (18 April). The need to develop a 'popular heritage awareness' (Alves Costa, 2005, p. 290) based on the awareness of the value of heritage as a developing factor was raised in Portugal, where an urgent debate on the regeneration intervention of architecture by critically analysing cases was suggested. According to *Alves Costa*, cultural identity, and therefore, heritage identity, is a current issue where heritage becomes a field of political debate (Alves Costa, 2005, p. 291). Today, this author considers that 'each case is a case and conservation theory will born from each context, never generalisable – a circumstance in which each author individual expression and the ethical obligation, of a rigorous and exhaustive historic and archaeologic survey of the building to transform, meet' (Alves Costa, 2005, p. 293). This stance lacks a social approach to heritage protection, which Pereira had pointed out by arguing for a humanistic perspective where heritage has been made by men, for men's use and memory (2000, p. 17).

4.3.2 Protection of *Liceus*

Registrations and inscriptions are strong indicators of the political interest in architectural heritage, as well as regular updating of on-line records. The degree of priority given to heritage of education, and particularly to *liceus* can be established by assessing on-line databases.

Portugal reached the first decade of the twenty-first century without even one secondary school *liceu* building listed, and the term 'school' was not a specific immovable asset type in the IGESPAR database, being categorised as 'civil architecture'. The search term hit 18 records, ranging from kindergartens, primary and secondary schools, and universities. In 1986, a technical school in Lisbon was the first secondary school facility to be listed as a Public Interest asset. Searching the word '*liceu*' found that, although since 1978 the word *liceu* was changed to *secondary schools*, the heritage records still recognised the facilities by the former name: eighteen records were found, as built for purpose buildings, from which eight were waiting to be listed and ten have been closed. All the listing processes that have been closed, refer to *liceus* built in the second half of the twentieth-century.

In Portugal, the National Inventory of Architectural Heritage (IPA) was established to fulfil Portugal's obligations under the *Granada Convention*. The relevance of this inventory relies on its origins, purpose and range. Founded in 1929, the General-Directorate for National Buildings and Monuments (DGEMN) was responsible for interventions in the architectural heritage of the state, including schools. Since 1992, its significant documental archive has been managed and developed under the *Information System for the Architectural Heritage* (SIPA). This work

was passed to the Institute for Housing and Urban Rehabilitation (IHRU) in 2007 due to the retiring of DGEMN. Following international charter recommendations, SIPA has been managing information and documents of Portuguese architectural heritage with the aim to identify, understand, manage, safeguard and enhance cultural assets. With its database available online, it is a tool for managing private and public architectural heritage. SIPA considers the architecture constructive framework and its contained meanings which convey values, such as historical, social, political, scientific, technical, environmental or other. Following this principle, to register a significant built structure, labelled by SIPA as a 'Monument', the selection criteria is listed as follows:

- a) The importance of their authors, locally, nationally or internationally
- b) The importance of projects regarding its regional or national scope
- c) The quality of insertion in the territory
- d) Authenticity
- e) The frequency in a restricted territory
- f) Document:
 - a. historical, social and cultural moments
 - b. aesthetic expressions
 - c. construction techniques (local, regional or national) very specific and in danger
 - d. current practices in a given community
 - e. symbolic or legendary values
 - f. scientific values

In the SIPA electronic database, '*liceu*' is identified as 'Educational Architecture from the twentieth century', showing the recognition for this building typology of education. Another database, the *IAPXX: Survey of the Portuguese Architecture of the twentieth-century*, consulted online, includes 18 entrances referring to *liceus* under the theme 'educational facilities'.

In the case of *liceus*, the study of the cultural heritage of education cannot be fixed only on buildings, for which there are material education assets in danger of disappearing, such as objects used by people who attended *liceus*. Mogarro has conducted research on this topic – an FCT-funded project on 'Education and cultural heritage: schools, objects and practices' (2010, 2013). Burke and Grosvenor also stressed the importance of schools' objects for education and practices (2008), focused on objects in schooling, which, taken individually and

together, constitute the sites of schooling (Lawn and Grosvenor, 2005), stressing that they should not 'remain invisible from inquiry into schools as sites of learning and work'.

4.4 Change and the Government Solution (SMP)

This section describes the changes to education policies, the government's 'diagnosis of the Portuguese school building stock' (Heitor, 2008a, p. 28) and the need for an intervention strategy. It then provides a brief overview of the Portuguese's School Modernization Programme (SMP), which sets the framework for the design strategies of the rehabilitation of individual *liceus*. This section analyses the rehabilitation design context, between 2007 and 2010, describing the rehabilitation programme background to understand the problems to be addressed by architects, the design guidance provided and the importance given to *liceus*' cultural significance.

4.4.1 Changes in the Portuguese Education System

Relevant changes for the rehabilitation of historic schools started back in 1986 – a historic year for the future of Portuguese citizens as it was the year that Portugal joined the European Union and the year that the Portuguese Education Law was established.¹² Only two years later, an article was published in the European Journal of Education addressing the challenges Portugal faced in achieving competitiveness abroad and internal development ('The Process of Modernisation and Secondary Education in Portugal', (Emídio, 1988, p. 195). The decisive moment, as previously explained, would be in line with European strategies (European Parliament, 2000). This was the beginning of a process that would link the Portuguese education system requirements and European policy on the first decade of the twenty-first century, as interventions in school buildings would be required and made possible with the financial support of the European Investment Bank (EIB).

In the early twenty-first century, *liceus* buildings, always owned by the state, have been in continuous use. These facilities remained the places of provision of secondary education to students aged between 15 to 17 years old. To integrate the different levels of compulsory education in the same organisational unit and in the same place, the public schools network

¹² Law n.o 46/86, 14th of October: Education Law.

was redesigned in 2006. By implementing a school cluster policy named 'C+S' in 1985¹³, it was established that most of these buildings could also provide basic education to third-cycle (lower secondary, for students aged 12 and older) and, occasionally, to second-cycle students (aged 10 years and older). This decision tested the capacity of *liceus* buildings to accommodate an increased number of students. In 2007, compulsory education lasted for nine years, from 6 to 15 years of age. However, in that same year, a political priority was established: to raise the levels of qualification of the Portuguese population (Ministry of Education, 2007, p. 9). Three measures were decided: to extend the compulsory education period from 9 to 12 years, to adopt the 'daylong school', and to provide different types of courses within the same education facilities. These objectives required the improvement of the learning environments, namely by ensuring a variety of educational activities beside classes periods, by providing the technical requirements inherent to the vocational and specialised courses, and by guaranteeing the suitable environment conditions for the accommodation of more students at secondary school facilities.

4.4.2 Changing Education Needs, Changing School Buildings

As previously discussed (see section 3.3.1 Education Change in Historic School Buildings), at the beginning of the twenty-first century a new learning culture is advocated for which the traditional organisation of school space needs to be rethought (Heitor, 2009). Besides adapting the original facilities to academic expansion and extension of compulsory schooling in the last decades of the twentieth century, existing schools are now trying to keep up with current education trends and philosophies, although maintenance has not been implemented to overcome the expected wear and tear of a place used daily by hundreds of young people. Besides a lack of comfort, accessibility, energy efficiency and ICT are not complying with current standards for public buildings, particularly for secondary schools.

At the beginning of the twentieth-century, some experts considered that secondary school buildings were 'functionally obsolete and not suitable for modern educational needs in terms of environmental comfort, security, accessibility, classrooms, libraries, laboratories, image and information technology education' (Almeida et al., 2010, p. 16). In order to meet Europe 2020 environmental norms, the EIB has signed loan agreements such as school capital investment programmes to enable the refurbishment of public secondary schools to a high standard of

¹³ Law-Decree n.o 46/85, 22nd of February, where 'C+S' stands for compulsory education upper cycles (C), particularly the 3rd cycle, joined with the secondary level (S).

energy efficiency. Such have been the cases of England, Ireland, Serbia, Romania, France, Greece, Turkey, Spain, Portugal, etc.

Rehabilitation interventions contribute to energy saving, as no energy is used for demolition or new construction and the embodied energy in building materials and assemblies is reused. Furthermore, the retention of building materials results in less construction and demolition debris, diminishing the need for new materials and finally contributing to a sustainable environment. The problem and the strategic solution had been established.

4.4.3 The Schools Modernization Programme (SMP)

Programme general brief overview

Framed by the European Education policy which considers a well-educated population as critical for the development of a nation, this section describes the Portuguese Schools Modernization Programme (SMP)¹⁴, managed by Parque Escolar EPE (PE), a corporation governed by public law.

At the beginning of the twenty-first century, EU financial assistance prioritised initiatives related to sustainable growth and job creation, including investment in the urban environment and supporting the development of human capital by investing in education and training. In this context, SMP fitted the financial support programme Qualification of Urban Spaces and the opportunity was seized, despite the time and budget constraints of the funding. This funding also enabled the programme to be expanded to the whole country and not just the two main cities of Lisbon and Porto. This fact demonstrates that regardless of the sensitivity of the Ministry of Education (ME) towards historic buildings in city centres, the rehabilitation option was ultimately taken not for heritage protection purposes or the cultural values of such historic places but because the financial support was available.

As the national government had had no experience designing or constructing new facilities since the pavilion type school was originally designed in the 1960s, the 'UK Building Schools for the Future' (BSF) investment programme (2005-2010) to rebuild or refurbish secondary school buildings was used as a reference (Heitor et al., 2009). SMP aimed for objectives and timeframes very similar to the UK model, and references to the English experience can be recurrently found. This programme produced a significant amount of information and was

¹⁴ *Programa de Modernização das Escolas Destinadas ao Ensino Secundário* Parque Escolar (2009b) *Manual de Projecto: Arquitectura versão 1*. Lisboa: Programa de Modernização das Escolas do Ensino Secundário..

becoming a topic of research interest, not just for education but also for the design and construction sectors. However, the BSF model also considered the option of the demolition of historic facilities and replacing them with new school buildings, which was not the case in Portugal. This fact was justified to have been due to the young age of the school stock with over 70% of secondary schools built after 1968, and therefore, it was assumed that they were capable of being rehabilitated. However, this research confirmed that funding for rehabilitation was the main reason.

In fact, financial assistance is now framed by the idea of sustainability, and in this context, the 'qualification of urban spaces' programmes¹⁵ fitted perfectly with the school upgrade programme, so the opportunity was taken. This clearly reaffirms that regardless of the Ministry of Education's respect for historic buildings in cities centres, the rehabilitation option was taken chiefly for financial reasons. Such drivers – the availability of finance and the state of the global economy – had been further identified in the first OECD/CELE report (Almeida et al., 2010).

The SMPs Operational Process

The SMP set out with the aim to build to remodel and refurbish 332 secondary schools in Portugal by 2015 (Parque Escolar, 2009b), including 23 historic *liceus* built before 1950. The corporation Parque Escolar EPE (PE) – a special purpose state-owned company – was created in 2007 to implement the SMP, subject to the supervision of the Finance and Education Portuguese Ministers. PE was in charge of managing the design and build, furnishing and equipping of the Portuguese secondary schools network. The corporation was further allocated funds to guarantee the post-construction maintenance and upkeep of the schools. Considering the diversity of school building types, the first planning strategy implemented to achieve this objective was to establish several phases so that lessons learned from one phase could inform the next. The first phase was named the Pilot Phase, or Phase Zero, followed by Phases One, Two and Three, and a fourth phase was under design at the time of the research fieldwork.

Considering the diversity of school buildings, the first planning strategy implemented to achieve this objective was to conduct a pilot phase in which selected cases would represent one different type of building. The diagnosis of the existing schools was as follows:

¹⁵ Within the European Investment Bank (EIB), QREN-FEDER [Programas Operacionais do QREN - FEDER e Fundo de Coesão: Valorização do Território (POVT)], Government (PIDACC - Programa de Investimentos e Despesas de Desenvolvimento da Administração Central + IIE) and Council of Europe Development Bank (CEB). This finance operation model is expected to run from Set/2008 till 2037.

The public secondary school network as it is today consists of a total of 477 schools, the construction of which began in the late 19th century. Of this total, 23% were built by the end of the 1960s. The remainder (77%) originated in the period of expansion of the school network and extension of compulsory schooling first to seven and later to nine years. Some 46% of the schools were built in the 1980s.¹⁶

The overall aim of phasing was the production of knowledge from lessons learned to be further applied in the sequential phases to take place subsequently, in several phases. The process of implementation of the programme had a tight timeframe and a structured phasing of delivery, aiming to complete 205 schools by the end of 2011 according to the following scheme (Almeida et al., 2010, p. 21):

‘Pilot Phase/Phase 0: 4 schools completed by the first quarter of 2009.

Phase 1: 26 schools to be completed by 2009.

Phase 2: 75 schools construction to start in 2009 and be complete by 2010.

Phase 3: 61 + 39 schools construction to start in 2009 and be complete by 2011.’

Selecting Experienced Architects

Historic school buildings were perceived as requiring different interventions within SMP. First, they were perceived as requiring higher investment due to the technical solutions required to deal with buildings’ specific problems, which were considered to be related to their period of construction. Second, the assessment of heritage values and the decisions regarding their preservation and enhancement required experienced architects to engage with the issue of historic integrity and define ‘specialised’ design strategies, supported by site surveys.

The Pilot Phase included a building from each typology of secondary schools and also included three *liceus* buildings, designed and built in the first half of the twentieth century. This demonstrated the perception that, although the sum of all secondary schools, including non-*liceus*, constituted almost half of the building stock, the adaptation of *liceus* buildings would require special attention due to their varied designs and specific values. Within the SMP operational process, architects with conservation experience were commissioned for interventions in historic schools, as one deputy director noted:

‘Buildings with historic value receive special attention, since they require larger investments in order to protect their architectural integrity through specialised conservation and restoration work. Architects surveyed the sites and observed the buildings before assuming any design decision’ (Heitor, 2008b, p. 2).

¹⁶ <http://www.parque-escolar.pt/en/program/historical-context.aspx>, at 2014.05.14

According to PE, practices with experience in architectural rehabilitation were selected, to comply with legal and ethical requirements, to be supported by previous knowledge of *liceus* sites and buildings' specific characteristics. However, no rehabilitation guidelines were given to the design teams indicating that PE recognised the existence of heritage values to be preserved; this issue was left to be assessed by the experienced architects.

Providing some educational guidelines, PE asked schools to establish a strategic plan, a 'vision' of the institution's future, according to each school educational project, its 'principles, values, goals and strategies' (Almeida et al., 2010, pp. 80-82). Stakeholders were expected to participate in such projects. In the context of the SMP, stakeholders were identified as 'the Ministry of Education agencies; representatives of educational authorities; school principals, teachers, staff, parents and students; the national parents organisation; teachers' unions; teacher professional organisations; consultants to Parque Escolar; architects and engineers involved in the programme' (Almeida et al., 2010, p. 11).

As public projects, the disclosure of interventions in each school was required, for which architects produced panels to be displayed in conferences and meetings organised by PE. These were also used in the public discussions conducted at each individual *liceu* at the Master Plan stage in order to receive feedback from the school community. PE suggested to schools to include all stakeholders in the identification of the needs and aspirations of each school, leaving the responsibility of the participation model to be managed by each school board.

Rehabilitation needs time. However, PE stated that it aimed 'to ensure the most rapid and effective execution of the renovation programme'.¹⁷ This rush was signalled by the OECD which pointed out 'the speed of implementation of the programme (Almeida et al., 2010, p. 6). As, in the case of rehabilitation, rush is the 'enemy' of perfection, it suggests that the results might not be as expected.

Overcoming the time spent in planning controlling devices was a way to reduce the time in the process. Exemption from previous municipal control is granted by law to all public buildings, but not to those which are heritage listed, or waiting to be listed, or if *per se* they were included in a buffer protection area or as part of a site. The time spent in Portugal trying to get local planning authority permission to build usually exceeds what is defined by law, and is a lengthy process by definition.

¹⁷ <http://www.parque-escolar.pt/uk/strategic-context.php> accessed at 2010-11-29.

As previously said, initiatives in public buildings promoted by the state are exempt from such processes. However, this programme was run not by the state but by a corporation governed by public law. To overcome this issue, the law was changed and enlarged to such entities.¹⁸ Nevertheless, not even such entities are exempt from submitting a 'previous communication' to municipalities, including the accessibility plan to demonstrate that the technical standards for accessibility have been considered. Although the purpose was merely to inform, several municipalities issued an assessment of the project.

The symbolic location of schools in the urban and social environment, the lack of available urban plots in urban centres, and 'the urgent need for intervention at this level, justified the choice of an intervention model based on "renovation" without interrupting academic activities' (Heitor, 2009, p. 19). The proposed model considered the reorganisation of school space, articulating different functional sectors 'using a "learning street" strategy' (Heitor, 2009, p. 20), and enabling the school to remain open to the community. An idea of 'transparency' is expected to reach the community which will then be invited to use the facility.

4.4.4 Design Process

The objectives regarding the physical space aimed for:

- 'Attractive spaces that promote well-being, allow good teaching practice, provide access to information and support teachers' work outside the classroom;
- Flexible spaces that can adapt quickly and inexpensively to changes in the curriculum, to evolving pedagogical theory and practice, to the demands of the school community, and to the fast developments in ICT.
- Multifunctional spaces for diverse and widespread use by the school community.
- Safe, accessible and inclusive spaces that provide users with a healthy environment and support people with restricted mobility and special educational needs.
- Durable and environmentally efficient solutions to reduce energy consumption, as well as management and maintenance costs' (Almeida et al., 2010, p. 19).

The list assumes that current spaces of existing schools, either historic or recent (1990s), do not offer suitable learning environments for the current education system: they are unattractive, inflexible, subject/function-specific, and they raise concerns regarding safety and accessibility. Sustainability issues, environmental and economic, are added as a problem in need of technical and architectural solutions. While the last topic has been the subject of much

¹⁸ The Law-Decree n.o 555/99, from 16th of December, further amended by the Decree-Law n.o 177/2001, from 4th of June, established in its article 7º the exemption of planning permission in several urban operations promoted by the public administration, from which, b) those promoted by the State regarding public services facilities, or facilities with direct public use.

research, no research was found on the results of interventions regarding space qualities on social and cultural sustainability, which seems to indicate that, if quality is provided, social and cultural sustainability will be too. Further information has been provided to architects, such as a metric surveys and technical surveys of the conditions of structures, with a focus on a seismic analysis. It should be said that liceus buildings do not comply with current building codes and regulations, and therefore seismic strengthening of school buildings was compulsory in these interventions (Proença and Gago, 2011). This is of major importance when analysing places' identity as the structural safety component in rehabilitation can be intrusive and impact on buildings' main characteristics, such as their facades.

SMP Design Briefs

Regarding the design briefs, buildings' physical condition and the number of students were the initial criteria defined in order to prioritise the interventions. However, no evidence was found that these criteria were followed, as in the cases of 1909 *Liceu Camões* (Lisbon), 1936 *Liceu D. João III* (Coimbra), and 1939 *Liceu Alexandre Herculano* (Oporto), each of which is in urgent need of intervention but has no predicted date for construction. Although the identification of the specificity of these building types has been acknowledged, the guidelines produced for the modernisation programme do not provide any guidance regarding a heritage approach to historic buildings. Instead of answering the question of how to design new learning environments, which can be found in the manuals, in a heritage approach to existing buildings, the question is instead: how can we conserve historic school buildings' cultural significance while updating to current needs?

Parque Escolar involved staff and external consultants in the fields of landscaping, archaeology, laboratories, museums, workshops, building anomalies, physical conditions, acoustics, accessibility and libraries (Blyth et al., 2012, p. 37). Some design manuals have been published with sets of design guidelines, some with 'rigid diagrams expressed almost like floor plans' (Blyth et al., 2012, p. 37), which has been considered restrictive by the OECD/CELE review team.

The rehabilitation process has three principal phases: pre-design, design and construction. At the pre-design stage, the strategic plan is designed by each school where their vision of the school in the future should be expressed, based on its educational goals and existing infrastructure. This document, containing the needs and aspirations of each individual school, is the basis for the development, by PE, of the functional programme and schedule of accommodation. This entails the design brief provided to architects, which works as 'a

conceptual matrix and is supported on a conceptual diagram that explains how this should be translated into building form' (OECD/CELE, 2011a, p. 12), initiating the design stage.

The position of PE regarding historic *liceus*' cultural values was the following, as generally described by Lawson in architecture practice: when clients and architects have each one specific knowledge, it induces successful design, as 'the client knows most about the problems, needs and requirements. On the other hand, designers tend to have considerable knowledge about design possibilities. Clients know what needs to be done. Designers know what can be done' (Lawson, 2004, p. 28).

PE delivered the following documents to each design team:

1. A generic design brief (GDB) with requirements that should be applied to all schools;
2. A school-specific design brief (SDB), with the specific requirements of each individual school.

The latter contained a list of rooms and spaces required by each school, including for most spaces, references to area requirements for each room, such as services (e.g. electrical outlets; water supplies), details of environmental performance requirements (e.g. in relation to lighting and ventilation), general layout issues on education furniture and equipment, and ICT provision. The first edition of the SMP Design Manual (Parque Escolar, 2009b) included many of the issues that were previously tested in Phases Zero and One, as well as documents that had been given to architects to support their work. Besides establishing strategies to be adopted in the reorganisation of the school space, the design manual further described the conceptual model to be adopted by each school and provided design solutions for formal and informal learning spaces. The Design Manual is used here to demonstrate PE objectives.

'The new learning environments for the twenty-first century require spaces that are attractive, flexible, multi-purpose, secure, accessible and inclusive, through the use of long-life solutions, either physical, environmental and functional' (Parque Escolar, 2009b, p. 2). Historic *liceus* were old, degraded, and had a rigid structure with designed-for-purpose rooms, lacking an anti-seismic structure, and presenting a range of problems in terms of accessibility.

PE suggested a functional-spatial model based on the relationships between formal learning spaces and informal learning areas. This model was intended to be adapted to the needs, objectives and characteristics of each school, entailing the idea that 'the school building model adopted is not a school type but a type of school' (Parque Escolar, 2009b, p. 2). This model is

summarised in the diagram below (see Figure 4.1). It presents the new formal and informal twenty-first century learning environments, emphasising that some areas could be opened up to community use after school (spaces with red dashed line). The Design Manual in effect introduced Hertzberger's concept of the 'learning street' (Hertzberger, 2008, p. 124), with roots in the 1960s Montessori School (Delft, Netherlands), as the place of informal learning. Hertzberger was invited to explain his design strategy in a public conference in Lisbon organised to join all architects involved in the SMP (Silva, 2010). With a full auditorium, the architect talked about the values of school buildings as well as the impact of architecture on student, teacher and staff well-being. The researcher participation in this conference contributed to the theoretical and perceived need to involve these stakeholders in the rehabilitation design of *liceus*.

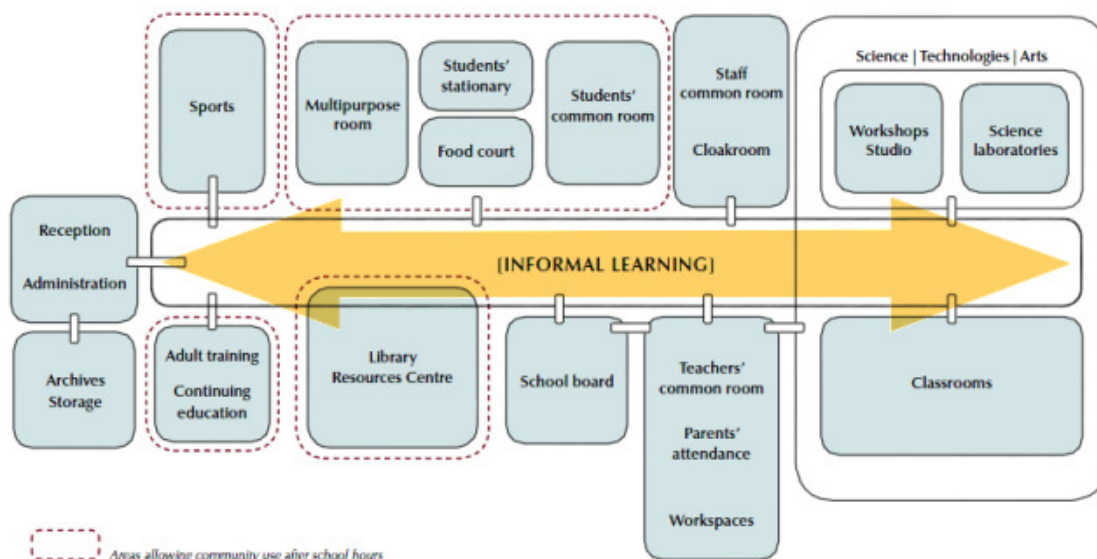


Figure 4.1. Diagram of the conceptual model for functional-spatial organisation, in (Heitor et al., 2009)

Regarding the management, safeguarding and rehabilitation of listed buildings, or buildings awaiting listing, the SMP programme was run under an 'exception regime' due to the fact that it is a government initiative and needed to be delivered within the tight timeframe established for completion of the programme by the Ministry of Education and the programme's funders. However, despite these time pressures, PE decided to inform municipalities and sought heritage impact appraisals from the Ministry of Culture (IGESPAR) in the case of buildings awaiting listing.

4.4.5 Research on SMP process

Although some research had been previously conducted on SMP – namely on buildings' physical conditions (Marques, de Brito and Correia, 2015) and the use of Post Occupancy Evaluation tools in Portuguese secondary schools (Watson, 2005) – studies continued to be conducted in parallel with the implementation of the SMP, for example on the cultural heritage of education (Mogarro, 2013) and on the methods used for the conservation of traditional structures (Mestre and Aleixo, 2014). A number of topics were investigated when interventions were completed, including: the OECD's review of the impact of the SMP on the quality and suitability of school buildings (Blyth et al., 2012); a review of the SMP's education infrastructure policy (Blyth et al., 2011); research on the evaluation of inclusive design in the new environments (Lopes, Aguiar and da Silva, 2012); the evaluation of the impact on socio-educational and urban dynamics (Veloso et al., 2014); research on a sustainability assessment method for school buildings in Portugal based on environmental certification tools used in the construction industry (Saraiva, Almeida and Bragança, 2015); and research on acoustic solutions proposed and the experimental measurement of the results of these solutions (Inácio, 2010).

Lastly, one researcher on the history of *liceus* architecture shared the present researcher's feelings that SMP was an opportunity to discuss the rehabilitation process of historical school buildings in Portugal, and to reflect on the role of heritage in the process. In a recent paper presented at IE International Conference 2012, Alegre (2012b), focused on the analysis of two historic *liceus* architectural and constructive identity, and on the conceptual strategies and design principles used in their rehabilitation. However, the conclusions were supported on the false premise that one *liceu* was not listed and the other was, when in fact both were listed.. Both *liceus* aimed for the preservation of integrity and authenticity of the original building, thus by concluding that a 'compromise solution' was adopted in the listed building to 'keep the memory of the school/community to future generations', while a 'more active attitude' was taken in the un-listed *liceu*, with the introduction of a new building and changes to the original interior and exterior spatial organisation, therefore adding a new layer of history to the building, the author is highlighting a preconceived idea: heritage classification hinders 'active attitudes' and constrains design decisions by mitigating the opportunity to introduce a contemporary layer in historic buildings. This fact suggests that the conclusion was narrowed to the visual impact of interventions, to the physical outputs of rehabilitation. However, this

thesis argues that changes in heritage values do not need to be visible to be felt, supporting a holistic evaluation of rehabilitation interventions.

4.5 Architectural Conservation Practice in Portugal

The cultural knowledge and professional experience of architects have been acknowledged as influencing the assessment of heritage places significance, the establishment of design principles, and having adapted design strategies for each particular intervention context. The purpose of this section is to briefly discuss the current architectural conservation situation in Portugal, in the context of international recommendations which argue for the need to have experienced professionals in architectural heritage conservation. Furthermore, it is clear that special skills are needed when designing education environments for the twenty-first century, as the literature establishes the need for new, appealing and modern school spaces.

4.5.1 Architects Thinking: Understanding the Design Process

In this research, design is considered according to Lawson's definition: 'the end product or (to) the process' (Lawson, 2006, p. 3). In this section, it is the design process that is being discussed. This process can be mapped by identifying a logical sequence of activities. There is a problem, generally stated in a brief, and provided by the client to a selected architect, usually based on previous work. The latter investigates the problem, gathers information and develops a solution that they communicate through sketch plans to the owner. These sketches are developed into schematic designs for applying for project planning approval. Working drawings expand and detail the previous schemes for site communication, under the supervision of the architect. After site operations are completed, the product is finished and the feedback stage starts. At this point, a new building is identified as a 'relative values design problem' because decisions are taken for a large number of people, involving degrees of 'benefit to some and losses to others' (Lawson, 2006, p. 78).

Before any intervention is conducted, architects create a personal theory, which they adapt to the specific context, for how change will take place, why it should take place and who the change is for. This theory is designed for each specific project, logically and convincingly describing and justifying the project assumptions: what are the problems (evidence showing),

what are the intervention goals (comply with brief and legislation), and what is being proposed to achieve those goals (based on selected evidence). An evaluation of effects must therefore take place so that outputs and outcomes are identified and measured and that each of the stages of the design process is assessed.

A polemic attitude: criteria of experience

'In buildings, in cities or in the continually humanised territory, the architecture of the next years will be marked by rehabilitation practice. Recuperation, in its varied forms, is not a new art, not even a new science, does not have disciplinary autonomy, neither it will ever be a specialist work. (...) Each project requires a specialist, always the same: an architect' (Alves Costa, 2005, p. 294). The new thing, the author argues, is to consider history as a subject matter of an architect's project. Alves Costa argues that to today's architect, only 'criteria of experience' is permissible: the one which does not refuse any data from the real, the existing, to be subject to personal interpretations and aims. He gives examples of architects which used the real - which contains the past and the aimed future – to find the rule (their rule) based on the existing, case by case, which is always perceptible in their work.

4.5.2 The Experience in Architectural Conservation: Contemporary Issues

School architecture has not been practised in Portugal for many years. The reason might be found in the robustness and flexibility of the existing school buildings that have adapted in terms of their physical environments to several education curriculums changes since their original construction. However, if the schools built in the first half of the twentieth century can constructively be defined as 'highly robust' (Parque Escolar, 2009b, p. 3), those built in the post-Second World War period, mainly constructed in light pre-fabricated structures, cannot be identified as having that same quality.

Stubbs has identified that 'higher education training in architectural conservation was not introduced until the 1980s' (2009, p. 102). With the Bologna Process (1999-2009) and the curricular recognition among European courses, university-based architectural education needed to adjust to the advent of mass higher education, and conservation became not a special type of education in itself but an additional module to be taken within the architecture course. The present researcher, herself an instructor on a Master's in Architecture course in Portugal, finds evidence of this in Spain: 'teaching architectural conservation has been in many cases neglected and relegated to a level of specialisation and postgraduate courses although

the professional competence in the field is attributed to the non-specialised architect' (Mileto et al., 2015). The experience of the researcher in teaching courses on regeneration (Oxford Brookes University, Masters in International Architectural Regeneration and Development), which is focused on social, community and sustainability issues (Orbaşlı and Vellinga, 2008), contributes to her deeper critical thinking on the issue of architectural conservation education and its implications in practice.

Therefore, it should be emphasised that 'architectural conservation, however, is distinct from the modern building industry in one main respect: It inevitably deals with history and changes to buildings over time' (Stubbs, 2009, p. xi), introducing a complexity in the stages of documentation, diagnosis, and the prescription of solutions, requiring specific education and training. Furthermore, in the case of public historic buildings, Stubbs further stresses: 'implementing architectural conservation solutions at important historic buildings that are publicly owned, held in trust, or in possession of owners having differing affections for the task often brings with it added scrutiny that often requires informed answers' (idem).

Accreditation

ICOMOS has recognised built heritage conservation and management as a field of expertise and knowledge (ICOMOS, 1993) and established the benchmark for the accreditation of conservation professionals, which is generally used in the UK (Orbaşlı and Whitbourn, 2002). In Portugal, the majority of architects have not achieved the denomination of 'conservation architects' by education but by practice. Architectural conservation in education is a recent subject. In fact, it is not yet a classification recognised within the Order of the Architects which is only now implementing the College of Architectural Heritage Speciality (CEPA) with little adherence from its members.¹⁹ To have a clear idea of what the Order considers to be a 'conservation architect', one must look at what it wants to see from applicants. The application requires a curriculum vitae with professional information describing proven professional experience in terms of architectural heritage. Activity in architectural heritage is to be evaluated by the following criteria: its 'qualification, duration and continuity', the 'role in which the architect intervened and also the diversity of work and professional practice'.

Under this application process, a 'professional career' in architectural heritage can be framed into three options depending on the context and the characteristics of the activity: 1)

¹⁹ The College of Architectural Heritage Speciality (CEPA) was created in 2004, implemented in 2009 and is now in a phase of installation, <http://www.arquitectos.pt/index.htm?no=101087,302> accessed at 2012-05-07. Although applications for nomination opened in 20.08.2010, one year later only 10 candidates had applied, demonstrating either a lack of interest or a lack of trust in the initiative.

architects 'who have a relatively constant and regular activity, linked to the carrying-out of research, studies and projects', should present a 'synthetic information of the various studies and projects in which participated and in which quality it participated'; 2) architects 'whose activity is geared more toward the advice or for the management and administration of architectural heritage', should provide a 'chronological presentation referring to the type of activities performed'; 3) finally, beside the possibility of fitting both options, there can be 'training and research activity in the areas mentioned'. Finally, three examples of authorship or 'significant participation' in architectural heritage work, 'investigations, studies, interventions, projects or other activities' are required to be submitted providing factual information²⁰, are required for the appraisal of the application.

The analysis of these requirements reveals the acknowledgment that there is a lack of specific education in the field of architectural conservation or that the existing education in the area is not recognised. The College Regulations (OA, 2009) require that, at the inscription moment and after full application approval, one of three options is fulfilled – an academic degree in an area of architectural heritage, an expert qualification obtained in an institution or through a recognised professional association, or proven professional experience with a minimum of three years in an architectural heritage field. Some uncertainties emerge: how are 'expertise qualification' defined? How can three years be enough experience to become a conservation architects? What type of evidence is provided? Why there is no proof of knowledge of international conservation principles? Why are architectural practice results not evaluated? How can level/degree of participation in the process, the time of practice and the continuity/regularity of practice evaluate cultural and ethical practice in architectural conservation?

Whenever areas of architecture with technical and scientific particularities gain cultural, social and economic relevance and require the expertise of knowledge or of professional practice, the Order Regulations (OA, 2009) justify the creation of Colleges. This fact reveals how heritage, and particular heritage conservation, has gained significance in Portugal. However, it further reveals how expert conservation architects are not afforded the esteem or respect commensurate with the responsibility of their profession, with architectural heritage conservation only offered as a 'window of opportunity' in times of recession and where work is scarce.

²⁰ 'CEPA - Members admission' at <http://www.arquitectos.pt/index.htm?no=101087,304> accessed at 2012-05-07.

According to the Order Status, the enhancement/valorisation of the built heritage is an architect's inherent activity. The Cultural Heritage Law²¹ requires that studies and projects in protected buildings and/or areas be designed and endorsed by professionals with the legally recognised qualification. The increasing importance of heritage and the expertise embedded in the field of architectural heritage has necessitated the creation of such a college. Members' duties do not refer to any specific requirements or commitments specific to architectural heritage, neither to international recommendations, guidelines or any other document regarding built heritage or architectural conservation. Once accepted as a member, there is no further monitoring of the conservation work produced. Curiously, one of the first outcomes of this college was the 'Inventory of the 20thc. Architecture – IAPXX' (OA, 2006) which became available on-line²², drawing attention to the number of interventions being made concerning buildings from this period, most of them not protected by law.

4.5.3 Cultural Expertise

The degree of cultural expertise of projects managers and participants can serve as strong evidence of project sustainability, particularly in the case of architectural heritage rehabilitation. The following discussion is based on the work of Throsby, where cultural expertise is considered an indicator based on a dimension of cultural capital: the intellectual dimension. Defined as the 'body of ideas, practices and beliefs along with artworks existing in the public domain (music, literature), that are received from former generations and passed on to succeeding ones' (Throsby, 1995, p. 203), the author suggests that it be measured using a set of specific indicators that can attest to the level of professional and artistic education of the participants and leaders of a development project. However, when the assessment is focused on sustainability, the level of professional and cultural advancement of targeted population is, Throsby argues, important evidence of a project's successful continuation as it ensures that a community can generate, in the future, its own leaders, ideas, and aspirations. Thus, one of the main objectives of every sustainable development project should be to educate successive generations of leaders, cultural practitioners and experts who can carry on the sustainability of the results and transfer successful practices in various domains of culture.

In terms of development indicators, or specific measures of sustainability, cultural expertise can be evaluated quantitatively and qualitatively. On the quantitative level, the degree of a

²¹ Law n°107/01, from September the 8th.

²² Beta version of IAPXX at <http://www.iap20.pt> accessed at 7 May 2012.

project's sustainability can be expressed by the number of trained individuals and artists that have succeeded on the local, national or international scenes, and the number of groups or communities that have successfully adopted and integrated a particular cultural model or practice within their neighbourhoods. Qualitatively, these indicators should be accompanied by descriptive observations, as well as with the results of surveys or interviews providing evidence of the positive attitude of targeted groups towards a specific functional programme in terms of their interests, willingness and abilities to give continuity to the established use.

4.5.4 Architects' Design Strategies

At the concept design stage, design research (RIBA, 2013) is undertaken. Being comprised of three stages – problem definition, understanding precedents, developing and testing – the RIBA model condenses the process of gathering existing knowledge to establish strategies and support design decisions. In a recent opinion article named 'The schools: design to adjust to the contemporary', Toussaint posed the question: 'How did the architects respond to different schools taking into account *Parque Escolar's* general programme and the more restricted variations?' (2009, p. 24). With reference to 13 rehabilitated secondary school buildings, the author suggests that personal opinions, the conditions of each school, architects' approaches and dialogue, alongside involvement from PE and the school community led to the establishment of different design strategies. In schools from the first half of the twentieth-century, where two cases are acknowledged, Toussaint finds the heritage factor characterised by the 'quality/figure of the architect and/or age' (p.25). However, the article does not provide any evidence on the basis on which these suggestions were set out. Nevertheless, by clearly laying down the question, it supports this research objective in understanding which design strategies were established in rehabilitation interventions in historic *liceus*.

4.6 Chapter Summary and Conclusions

Liceus are buildings where liceal (secondary level) education was provided between 1836 and 1974. Although not all *liceu* institutions had a purpose-built *liceu*, with many adapting other type of buildings, before 1952 23 *liceu* buildings had been constructed according to the education policy of the political regime, and to the aesthetics of the design period. These two

facts enabled the production of three types of *liceus*, architecturally identifiable, with an increasing value of inaccessibility inherent in their design and in their setting design.

Liceus have played an important role in the history of Portuguese secondary education, and historic *liceu* buildings occupy an important place in Portugal's architectural heritage. In continuous use since their inauguration, these facilities have evolved in accordance with changing education policies and general living standards.

Following an international trend at the beginning of the twenty-first century, Portugal has adopted new legislation on education and new guidance on school architecture, which focus on the educational environment as a whole, prompting a national modernisation programme to adapt existing secondary school buildings. Since 2007, the SMP has been the responsibility of Parque Escolar (PE). The innovative challenge posed to Portuguese architects, on a national scale, was to preserve and enhance the existing schools, regardless of their age, while adapting them to contemporary building standards and design guidelines for school architecture in the twenty-first century. The recent SMP made available for research, at the same time, interventions in different historic school buildings, in different cities, by different architects, but with the same educational and conservation objectives. Within the selected schools to be modernised are historic *liceus* from the first half of the twentieth-century.

Current architectural practice in Portugal has shifted from constructing new buildings to rehabilitating historic buildings, as a result of the global financial crises. However, in general, Portuguese architects have neither been trained nor had enough opportunities to practise architectural conservation, therefore suggesting that the criterion of experience should not constrain their access to this type of intervention. Aware of this market, the Order of Architects of Portugal has tried to establish a specific college to control its associates' activities but with little adherence. Given that international conservation guidelines recommend design strategies for conservation practitioners, advocating experience and practice in heritage conservation, and given the actual context of the architectural professional in Portugal, there is clearly a need for more information on the 'true impact of design decisions' (Lawson, 2006, p. 81) on architectural heritage sustainability for present and future generations.

Following these literature review chapters, Chapter 5 will explain the approach and methods used to design a tool to evaluate the effects of architectural rehabilitation on cultural values of architectural heritage, to be applied in the 'real world' and gather evidence in the case of rehabilitated historic *liceus* in Portugal. The results of the use of this tool in six case studies are reported in the following chapters.

Chapter Five. Designing and Operationalising an Evaluation Tool

5.1 Introduction

The literature review in Chapters 2, 3 and 4 identified the lack of an assessment tool to effectively assess the results of conservation interventions regarding the socio-cultural values of architectural heritage; however, it provided a conceptual framework for the design of such a tool. The purpose of this chapter is to design a theoretical model of a specific methodological tool for the *Evaluation of the Rehabilitation Effects on Cultural Significance* [ERECS], to be used in conservation practice to contribute to the socio-cultural sustainability of architectural heritage. The chapter further explains why a case study approach is the most suitable research strategy to be used. Portuguese historic *liceus* are then presented as suitable research cases with a number briefly introduced. The next section discusses the operationalisation of the tool for the specific context and, finally, ethical considerations of the research are discussed, outlining some reflective thoughts on the influence that being a practitioner has had in the development of the tool. The chapter ends with a brief summary to introduce the next chapters.

5.2 Establishing a Model for the Design of an Evaluation Tool

This section discusses the results of a review of the existing models which evaluate change as the result of a process aimed at communities change, in order to contribute to the design of an evaluation tool in the context of architectural rehabilitation effects on socio-cultural values attributed by heritage communities groups to historic buildings. The search for such models also sought out a sequential and flexible model which would allow processes to be identified, and the intended results compared with those effectively achieved, and which would be adaptable to different architectural heritage typologies, including to educational built heritage types.

5.2.1 Evaluation of Change

Some authors consider evaluation and research as different disciplines, as the first requires the assessment of value while the focus of the second is description, explanation and understanding (Robson, 2000, p. 9). The present research combines both. Among the different types of evaluations used to examine established programmes, the most basic distinction is found between formative and summative evaluations (Patton, 2002), which depends on the object being evaluated and the objective of the evaluation. While the first focuses on assessing the delivery process of a programme, considering the context, inputs and procedures, and therefore aims to improve the object of evaluation by focusing on enhancing knowledge and decision-making (i.e. the process), the second focuses on the moment subsequent to its delivery, with the aim of evaluating the effects of the delivered process regarding specific outcomes against pre-determined goals.

When considering programmes where communities are the targeted population, Patton has identified the meaning of the term 'impact assessment' as involving 'a comprehensive evaluation of the long-term effects of an intervention' (2004, p. 476), in contrast with a definition widely used in sustainability literature and policy as, for example, the one provided by the European Commission: 'Impact assessment is a set of logical steps to be followed when you prepare policy proposals. It is a process that prepares evidence for political decision-makers on the advantages and disadvantages of possible policy options by assessing their potential impacts' (European Commission, 2009, p. 4). This last view has been the focus of the definition used in recent guidance on Heritage Impact Assessments (HIA), which aims 'to evaluate effectively the impact of potential development on the Outstanding Universal Value (OUV) of properties (...) valuating impact on the attributes of OUV' (ICOMOS, 2011). Although using the same terminology, the different purposes of each type of assessment are clear: the first aims to assess the effective impacts of a process, only perceived in the long-term, while the second purpose is to predict effects before the process is established.

Patton's definition of 'impact assessments' goes beyond immediate or even medium-term effects, assessing the overall effects, in establishing if, if at all, outcomes were sustained or increased over the long term, for which two dimensions need to be made clear: time dimension and scope dimension. The present research focuses on outcome evaluation, where the direct relationship between an intervention (conservation design of historic buildings) and participant changes (attribution of values) is assessed and the scope is narrowed and focused

on this relationship as the immediate causal connection (Patton, 2004, p. 476), i.e., on the evaluation of short-term effects of design on cultural significance.

5.2.2 Methodology to Apply a Theory-Based Approach to Change

Triggered by the use of the term 'change' in architectural conservation theory and most current debates, a theoretical model for the evaluation of cultural significance change was sought. An adaptable and flexible theory-based evaluation tool was found in the context of Comprehensive Community Initiatives evaluation, or Community Change Initiatives evaluation (CCI), which assesses how communities' lives have been improved through systems change. This emphasis on systems change is what distinguishes a CCI, which uses long-term strategies to assess systems. In architectural conservation, there are also two systems in place that change: the cultural system, through the management of cultural material values of settings, and the social system, which alters the use of spaces, therefore, altering the pre-intervention perception of places. In the context of CCI, Taylor-Powell, Jones and Henert (2003) researched how logic models could contribute to enhancing programmes performance, and proposed a plan composed of three stages that would theoretically be required to achieve the process objectives (see Figure 5.1).

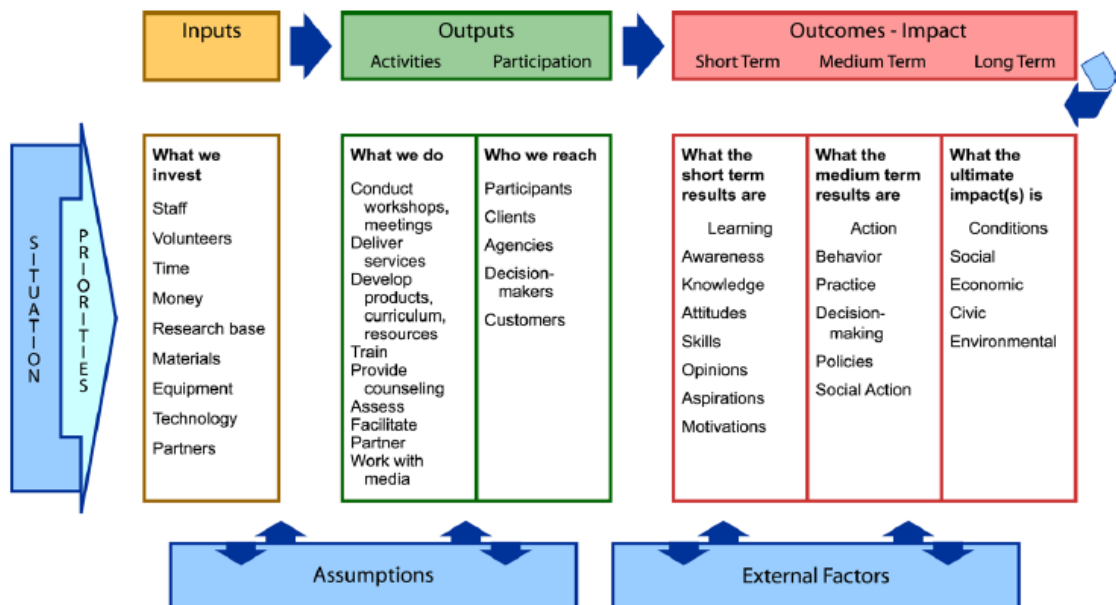


Figure 5.1. Logic Model to Enhance Program Performance (Taylor-Powell et al., 2003, p.23).

This logic model answers questions such as: what is expected to be achieved; and how and how well does an initiative actually work, therefore contributing to identifying positive and negative actions, and to improve the model. As Patton described, a logic model requires 'the systematic collection of information to make judgements, improve program effectiveness and/or generate knowledge to inform decisions about future programs' (Patton, 1997 in Taylor-Powell, Jones and Henert, 2003, p. 161). Additionally, to explore and understand the outcomes of community-based initiatives, the model follows a sequential logic of actions (Taylor-Powell, Jones and Henert, 2003), making it suitable to be applied to the study of architectural rehabilitation for two reasons.

Firstly, to establish the change induced by architectural rehabilitation in historic buildings' cultural significance, there is a need to conduct a comparison of values before and after the phenomenon occurred, entailing a longitudinal research study where the same case is studied at two moments in time and where changes are expected to be revealed (Yin, 2009). Although in the present research, the data required for such a comparison must be gathered retrospectively, hence the interventions have already occurred, the model suggests three moments at which to gather evidence about the results of interventions: 1, 5 and 10 years, therefore enabling the provision of knowledge on short-term results, long-term effects and ultimate impact.

Secondly, the main aim of the conservation of historic buildings is to serve users' communities, and even if interventions are not led by communities, they are the direct targets of conservation interventions. The safeguarding and protection of these heritage places, and their sustainability, is ultimately dependent on their users, who are the daily stewards of the heritage of the place for the benefit of future generations. Therefore, architectural conservation of historic buildings can be considered as a community-based project, and the previous logic model can be adapted for the study of architectural rehabilitation effects on cultural significance.

5.2.3 Qualitative Strategy to Develop an Evaluation Tool for Change

Following the literature review and practice experience, this research assumes that:

- historic buildings are an irreplaceable aspect of cultural heritage, a tangible and intangible legacy, with cultural significance as they are valued by communities, for which they should be kept in use and updated to current use needs, while safeguarding and enhancing the heritage place significance;

- international organisations (UNESCO, ICOMOS and CoE) have established useful guidelines for the safeguard and enhancement of cultural significance which should be applied in conservation design decisions;
- the change of existing values, material and immaterial, through architectural rehabilitation design, can contribute to the socio-cultural sustainability of the heritage place significance.

These assumptions call for the use of a qualitative research design as the focus is concerned with opinions, feelings and experiences induced by the physical phenomenon of architectural conservation, which in turn induces a naturally occurring social phenomena: change of perceptions. The aim is to understand and describe phenomena by taking a holistic perspective, not to manipulate the situation. The gathered data contributes to the development of theoretical concepts, i.e., taking an inductive approach to the development of theory, and a better understanding of the social world, which is constantly changing.

Developed from a variety of theoretical sources, the following conceptual framework has focused on learning 'about the problem with participants' (Creswell, 2009, p. 176), further informed by the researcher's professional practice in rehabilitation to ensure that the evaluation criteria would have a practical dimension, to be used in the future by architects, regardless of their experience in evaluation. Categories of values are therefore linked to a material cultural element where change can be identified and measured, or to an intangible value, where change can be the result of interpretation of associations, meanings or memories expressed by participants. For each value, the definition of 'successful cultural significance change' is therefore related to the beneficial effects on pre-existing values or the addition of new values. The following table displays a conceptual framework based on the literature review for an explanatory Theory of Change for Cultural Significance, which includes the socio-cultural dimension (see table 5.1).

Concepts	Cultural Significance		Sustainable Rehabilitation Design Strategies	Cultural Significance Change	
General Conceptual definitions	Aesthetic, historic, scientific, social or spiritual value for past, present or future generations; Considers tangible and intangible dimensions of place; Relative significance: integrity and authenticity Historical connections (ICOMOS Australia, 2000) and contemporary relationships (ICOMOS Australia, 2013)		Follow international guidance Include users knowledge in design decisions	<i>Adverse effects:</i> Loss of pre-existing values Mitigation of pre-existing values <i>Beneficial effects:</i> Retain significance (ICOMOS Australia, 2013) Enhance of pre-existing values Addition of new values	
Operational definitions	Cultural Material values of historic building	Social immaterial values of historic building	Respect values authenticity Preserve fabric integrity Enhance physical condition Assure reversible interventions Update functional use Add contemporary layer Conducted by expert architects	Cultural Material values of rehabilitated building	Social Immaterial values of rehabilitated building
Categories	Townscape Landscape Architecture Contents	Sense of place, continuity and community	All the previous	All the previous	All the previous

Table 5.1. Conceptual framework for an explanatory Theory of Change for Cultural Significance.

Currently, although architectural conservation has available some tools issued by UNESCO, ICOMOS and CoE to guide the design process, none were found to provide a holistic approach to socio-cultural values or to evaluate the effective results of interventions on such values. As previously mentioned, the HIA (ICOMOS, 2011), by not considering the real impact at a post-construction stage, cannot contribute to mitigating or avoiding negative impacts, either for effectively contributing to future interventions or to the design process, where it could inform how design strategies could best be established to achieve results which effectively contribute to the sustainability of cultural significance.

The socio-cultural dimensions of cultural significance have been chosen for the evaluation of change of cultural significance because of their particular relevance and explanatory power in addressing the central question of how architectural rehabilitation may contribute to the sustainability of cultural significance. Each of these dimensions requires different indicators, and therefore, different methodologies of assessment. Indicators of values depend on the type of architectural heritage, the type of conservation intervention, and the socio-cultural context in which conservation projects take place. Oriented towards rehabilitation practice effects on cultural significance, the theoretical framework to support the design of the tool has been established as well as observable and measurable socio-cultural indicators. Table 5.2 below provides the key indicators for the categories of material and immaterial values, following

Tuan's distinction between space and place: 'What begins as undifferentiated space becomes place as we get to know it better and endow it with value' (1977, p. 6).

	Significance Categories (values)	Significance Indicators (attributes of values)
MATERIAL CULTURAL VALUES	Setting	Spatial context Visual landmark Accessibility
	Townscape	
	Landscape	Building(s) location/dimension Use Accessibility
	Architecture	Form Functional-spatial layout/use Fabric
	Contents	Fixtures Furniture Equipments
IMMATERIAL CULTURAL VALUES	Sense of place	
	Place attachment	Affective dimension: feelings toward the place
	Place identity	Cognitive dimension: beliefs about the relationship between self and place
	Place dependence	conative dimension: behavioral exclusivity of the place in relation to alternatives
	Sense of continuity	Memories Rarity or uniqueness
	Sense of community	Collective esteem Shared meanings and values

Table 5.2. Categories and Indicators of socio-cultural significance and of sustainability (in red the elements to be respected in conservation (ICOMOS Australia, 2013)

As a discipline, architecture aims to contribute to the design quality of projects by understanding the link between design decisions and people (Groat and Wang, 2002). Architectural research allows researchers to address questions such as what makes a design successful, and knowledge can emerge by focusing on the physical outcomes of design, on the process of design, or on the practices of architecture. These two last types of research have been described as 'vital' by Groat and Wang (2002, p. 7), indicating a lack of theoretical knowledge about how architects work. These authors suggested that architectural research uses qualitative frameworks based on three assumptions: a methodological assumption that an inductive process can clarify factors that affect phenomena; an ontological assumption that reality is subjective and multiple as seen by participants; and an epistemological assumption that the researcher interacts with the subject of the research (pp. 26-28).

Therefore, this qualitative research (Miles and Huberman, 1994, Silverman, 2005, Bryman, 2008) was conducted following a philosophical paradigm of pragmatism combined with interpretivism. The first approaches the problem in search of understanding the link between

rehabilitation and changes in cultural significance, while the latter aims to understand the subjective meanings ascribed by individuals. The suggestion that 'pragmatism is not committed to any one system of philosophy and reality' (Creswell, 2009, p. 10), provides flexibility to the research and the use of multiple techniques, methods and procedures. This approach in the social, cultural and historical context, where meanings and values are established, and where the research occurred, enabled the use of ethnographic and survey methods to gather data, to analyse qualitative and quantitative data, contributing to answering the main research question. Qualitative methodologies further facilitate the use of a sequential strategy (Creswell, 2009: p. 10), enabling expansion from the findings of one method to the next. For example, some information gathered in the questionnaires with staff and teachers was further explored in the later interviews with school directors. In summary, among the several types of research designs in architectural research, namely the seven types identified by Groat & Wang (2002), the present research will use interpretive-historical research, qualitative research and case study research approaches to achieve the research objectives.

The inductive process of qualitative research required enquiries to include open-ended questions, which would allow participants to interpret and give meanings to the historic places, and subsequently allowed the generation of new meaning(s) from data interpretation. Such an interpretive and pragmatic approach was informed by the researcher's professional experiences and background. Her work in the architectural rehabilitation of schools provided inside knowledge of unresolved issues and raised pertinent questions, such as, and considering the short of time given to architects to the design stage, how has significance been assessed and what was the role of cultural significance in design decisions?

In this research, reality is assumed to be socially constructed, as each individual ascribes values according to their personal experience, knowledge and beliefs, therefore reality is subjective and diverse. To achieve a holistic understanding of cultural significance, material evidence and immaterial perceptions need to be gathered. Furthermore, as the topic of the research is close to the researcher's interests, personal values might introduce some bias in the study, which is discussed in terms of the participants' interpretation and that of the researcher.

5.3 Designing an Assessment Tool for the Evaluation of Rehabilitation Effects on Cultural Significance [ERECS]

The search for models that focus on how to apply programme theories to evaluation process theories has been the focus of evaluation researchers and practitioners such as Patton (Patton, 2004, Patton, 2002) and Weiss (Weiss, 1998, Weiss, 1995). Both researchers' work was studied and an adaptable theory-based evaluation tool was found based on CCI: the Theory of Change (ToC) logic model (Weiss, 1995). ToC's origins can be traced back to the mid-1990s when programme theory and programme evaluation were searching for new ways to understand theories behind programmes and successful means to achieve social change. The model was then defined as a way to find how and why an initiative works, describing the set of assumptions underlying the process and establishing connections between activities and results at each step of the process (Weiss, 1995). The process of change is therefore outlined by causal linkages in a programme to achieve its shorter-term, intermediate, and longer-term outcomes.

The idea to adapt ToC to the purpose of evaluating the effects of architectural conservation strategies on cultural significance therefore seems logical. Firstly, it is an inclusive process, considering the perspectives of several types of participants (those responsible for the provision of inputs, those in charge of actions, and those to which actions are aimed at). Secondly, the model can be applied by initially defining the desired impacts of the objectives, starting from identifying the required preconditions for effective actions, the input resources, developing to process/activities, and ending in results. Finally, the model can be developed retrospectively, for example in evaluations reflecting on successful, or not, actions, by conducting backwards mapping in tracing the links that end up in actual effects.

5.3.1 Theory of Change in the Evaluation of Cultural Significance Sustainability

The use of ToC in cultural significance sustainability is a challenge. A ToC approach has been used in international development where it is defined as 'an outcomes-based approach which applies critical thinking to the design, implementation and evaluation of initiatives and programmes intended to support change in their contexts' (Vogel, 2012, p. 3), and in establishing evaluation strategies and methodologies to evaluate CCI's and plan education reforms (Connell and Klem, 2000), as a tool for strategic planning (Anderson, 2004), etc. This

research has a double-value focus: those of the historic physical entities, i.e., the buildings, and those that result from the perceptions of these entities. It has been argued that physical sciences apply methods to provide knowledge based on explanation, generalisation and prediction (Williams and May, 1996) and that social sciences focus on human behaviour, addressing people and context, aiming to describe and understand society (De Vaus, 1996). Therefore, it has been further questioned whether the inquiry of physical phenomena can be researched using the same methods that are used for social phenomena (Williams and May, 1996) and vice-versa. This research considers that different methods are required to achieve each research objective, and namely to evaluate the socio-cultural context.

This research is about built places, the underlying design strategies for their rehabilitation, and the results of such strategies, material (output) and immaterial (outcomes). Buildings reflect the culture in which they were produced; therefore they have cultural meanings, according to each reader's cultural background and experience of the place. Buildings have contextual values which are linked to the place in which it sits and to the specific moment of assessment. All of these factors entail a cultural study approach to this research. Cultural studies research, as 'an interdisciplinary approach to the study and analysis of culture understood very broadly to include not only specific texts, but also practices, and indeed ways of life' (Buchanan, 2012), considers buildings as texts, as the result of design practice, and as practices, hence they are lived/used places. In the context of historic places, this research explores the concept of identity and of the meanings and significance for the users of such places who then become the sources of knowledge on those places. This research therefore adopts an approach closer to that of cultural heritage studies.

5.3.2 A Three Phases Tool

The design of the tool aimed to establish a flexible methodology, with the possibility of being adapted to other types of historic buildings with cultural significance, such as hospitals, prisons, etc. To operationalise an effects-oriented tool, aimed for use in practice, three assessment phases were established, which coincide with architectural conservation design stages. In each phase, components were conceptualised and operationalised so that they could be assessed. The link between components lies on the theoretical assumption that an action (architectural conservation) changes existing values, for which there is the need to: firstly assess previously recognised and used values, secondly to identify design strategies used, and thirdly to evaluate settings change and change in the importance given to

rehabilitated historic buildings in comparison with values ascribed at pre-interventions period. These three phases of the ERECS are now briefly described:

1st Input Phase: Establishing Cultural Significance

This phase defines cultural significance as the tangible and intangible values of a place, considering that the level of significance of a place is based on historical associations, the current integrity and authenticity of fabric, and on contemporary relationships. Therefore, cultural material values of historic buildings are defined by values of setting (townscape and landscape), of architecture and of contents, while cultural immaterial values of historic buildings are defined by the values that contribute to users' senses of place, of continuity and of community. Values can be established by analysing historic documents, site-metric surveys before rehabilitation, and by interviewing the users of the place.

2nd Planning Phase: Establishing Informed Design Strategies

In this phase, design strategies are conceptualised as the set of actions that theoretically would be the best to preserve and enhance significance in rehabilitation intervention, for which they have been operationalised by considering two types: those that aim to change the physical environment, i.e., cultural material significance, and those that aim to change the emotional environment, i.e. change of immaterial significance by providing different experiences of place to users. The rehabilitation design strategies found in the literature as best practices are those which defend and implement the principle of minimal intervention and so respect the authenticity of material values and preserve fabric integrity while enhancing physical condition. They also assure reversible interventions, update functional use, add a contemporary layer and are conducted by expert architects.

3rd Output/Outcomes Phase: Evaluating Cultural Significance Change

This phase evaluates effective changes of significance after the implementation of design strategies, in order to identify best practices, i.e., the set of actions that best achieved the objectives of rehabilitation: to preserve and enhance cultural significance for the benefits of current and future generations. This phase defines cultural significance change as alterations to the tangible and intangible values of a place, considering two levels of change: beneficial and adverse. Beneficial change takes place when design strategies are able to retain setting significance, by enhancing of pre-existing values while adding contemporary values. Adverse change occurs when architectural conservation effects are the loss or the mitigation of pre-existing values. The evaluation is based on the same dimensions and sub-dimensions as before

interventions so that comparisons can be drawn. Cultural material values of rehabilitated historic buildings are considered outputs, while cultural immaterial values of rehabilitated historic buildings are considered outcomes. The measurement of outcomes should be done in 1, 5 and 10 years so that the impact on socio-cultural values of the education community, the rehabilitation targeted population who use the heritage setting, can be effectively understood and measured.

Figure 5.2 on the following page is a graphic model of the proposed assessment tool for the Evaluation of Rehabilitation Effects on Cultural Significance [ERECS], based on 'Enhancing Program Performance with Logic Models' (Taylor-Powell, Jones and Henert, 2003: pp.134-138), and adapted for the case of interventions in historic school buildings.

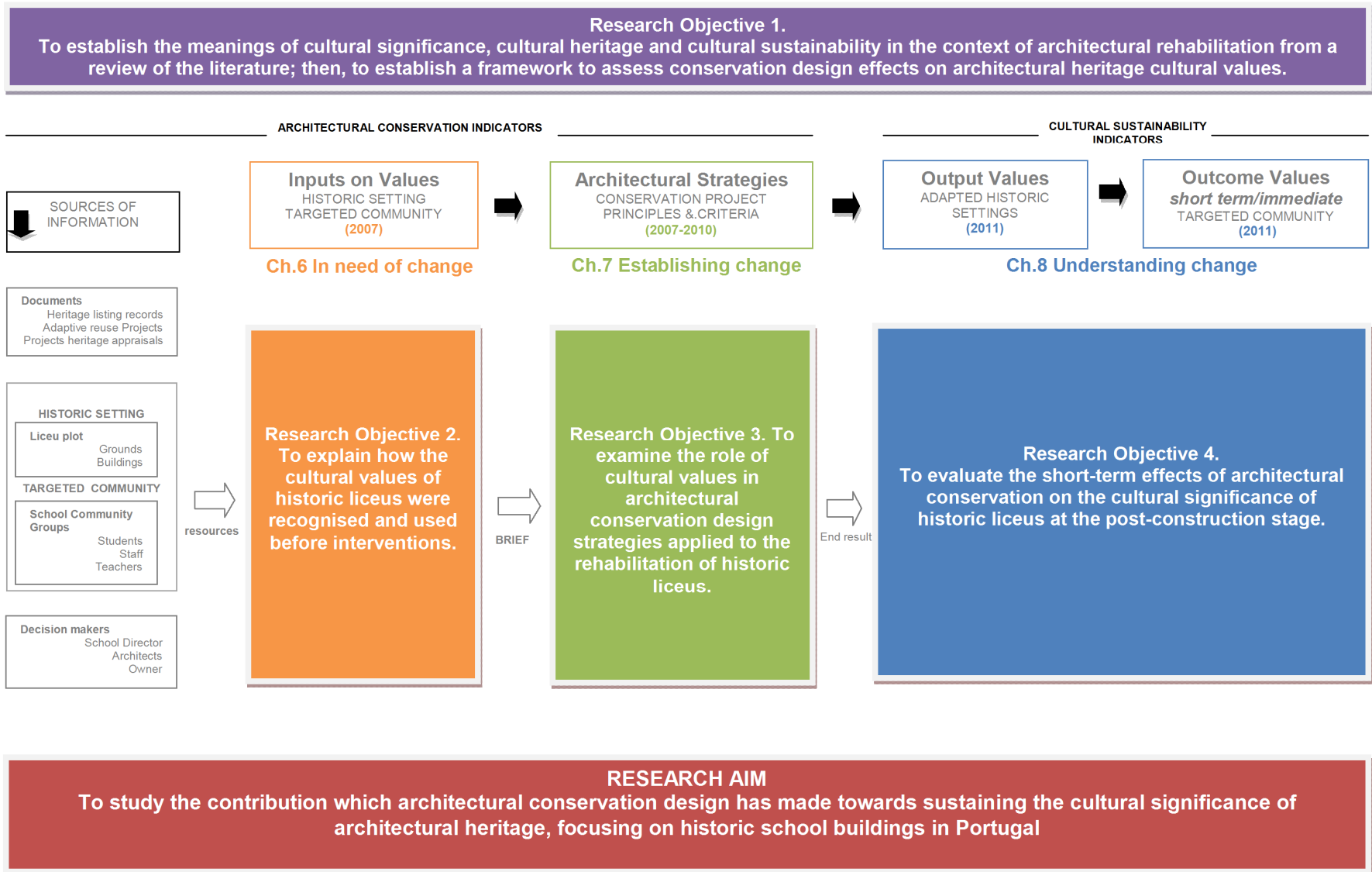


Figure 5.2. Graphic model of ERECS.

5.4 Case Study Strategy for ERECS

The literature review identified the use of assessments of cultural significance (Kerr, 2004, Worthing and Bond, 2008, ICOMOS Australia, 2013) related to the conservation of a specific architectural heritage, thus indicating the use of a case study approach. This flexible strategy of inquiry aims at a detailed and in-depth description of the selected cases and an understanding of a real-life phenomenon such as cultural significance change, followed by a thematic analysis of the data in order to answer research questions of 'how' and 'why' (Creswell, 2009). When seeking to understand present circumstances of contemporary events such as architectural conservation, where the researcher has no control over the events, Yin suggests the use of the case studies approach (2009).

The study of the cultural significance change of heritage places implies a contextual and longitudinal approach; contextual because it is about understanding cultural practices, their results and their meanings, and longitudinal because it aims to understand change caused by a temporal action in a specific time period, the results of which are expected to be extended/developed over time. This research further offers a situation where architectural conservation is influenced by existing historic places, and these places are influenced by architectural conservation, providing what Yin suggests as being blurred boundaries between a case and its context (2009).

Case studies are most suitable for mapping a sequence of events. In the search for outcomes, a retrospective design is required. Such a design requires the gathering of data at one moment about a previous period of time. The case history needs to be reconstructed through the collection, by different methods, of documents, archival records and interviews with those who experienced or observed the previous situation. Problems with this type of design may arise at the data analysis stage, as it involves the loss of evidence, a reconstruction of the past affected by the present, and the possibility of having an inaccurate report of the sequence of events. These problems can be reduced by the use of multiple sources of evidence about specific categories, or themes. The objective is to obtain a detailed image of the sequence and the context in which events took place (De Vaus, 2001) so that the cause of change can be clearly identified.

Testing this tool requires the use of multiple-case studies. In comparison with single-case studies, they offer more insights and are more convincing and powerful. Each case, individually approached and given a full account, enables cross-comparison, while respecting its unity as a single case (De Vaus, 2001). The method used to identify cases for this purpose was chosen to strengthen the generalisability of the findings. Therefore, the choice was not to apply a sampling logic but a replication logic (Yin, 2009) in multiple case studies, in order to investigate multiple conservation design strategies, according to the specific context of each intervention and to the author of such proposals, and further evaluate their effects on cultural significance. The case study strategy was designed in such a way that enables cases from the same period, for example building typologies from the 1930s, to corroborate each other's findings (literal replication), and so that cases could support different theoretical conditions (theoretical replication), as for example when different results are obtained across cases from different periods, i.e., with different architectural attributes. By addressing each case study individually, the research aimed to achieve broad generalisations supported by triangulation of evidence – a method frequently used in architectural research (Groat and Wang, 2002).

5.5 Research Context and Case Studies Selection

The occurrence of a national programme for the rehabilitation of secondary schools in Portugal, including historic facilities, provided the multiple required cases where the phenomenon of cultural significance change as the result of architectural conservation interventions could be observed one year after conclusion. Therefore, for the purposes of this research, the architectural heritage typology selected was historic *liceus* from different time periods, which reflect a specific architectural style and responses to educational policies at different periods.

This research focused on six historic *liceus* as examples of twentieth-century architectural heritage of education in Portugal, selected according to pre-defined criteria from the recent Schools Modernization Programme (SMP) for public secondary schools in Portugal. This choice relied on the fact that historic education facilities have recognised cultural significance (see Chapter Two) which, when subjected to architectural rehabilitation, is assumed to be changed (see Chapter Three). The selection was firstly based on investigating rehabilitation projects of *liceus* identified in Portuguese architectural history literature through an online search on the

IGESPAR and *Parque Escolar* websites. Following the establishment of a list of all purpose-built *liceus* buildings, six were selected which comply with the selection criteria required to answer the research objectives (see Table 5.2): suitability (1.2.3.4.8.), representativeness (5.6.) and comparability of design strategies (7.).

Case study code		1PN	2RF	3DG	4FL	5CM	6DM
Criteria							
1	Included in SMP (shared rehabilitation inputs)	yes	yes	yes	yes	yes	yes
2	Original building type (secondary Schools)	<i>Liceu</i>	<i>Liceu</i>	<i>Liceu</i>	<i>Liceu</i>	<i>Liceu</i>	<i>Liceu</i>
3	20 th c. building (included in architecture Inventories)	yes	yes	yes	yes	yes	yes
4	With listing process opened (national significance under consideration)	yes	yes	yes	yes	yes	no
5	Time period	1908-1911	(1914)18-1932	1929-1936	1932-1938	1943-1951	1943-1948
	Architectural style	Eclectic	Eclectic	Modernism	Modernism	<i>Estado Novo</i>	<i>Estado Novo</i>
	Educational policies	Monarchy 1 st Republic	Monarchy 1 st Republic	Military Dictatorship	Military Dictatorship	2 nd Republic	2 nd Republic
6	Location (national representativeness)	Lisbon	Oporto	Beja	Lisbon	Oporto	Coimbra
7	Rehabilitation Architects (commissioned two projects, for buildings from different periods)	Arch1	Arch2	Arch1	Arch3	Arch2	Arch3
8	Rehabilitation finished simultaneously (enable same time of use experience)	yes	no (2 years before)	no (delayed for 1 year)	yes	yes	yes

Table 5.3. Criteria for case studies selection: suitability, representativeness and comparability (the author, 2010)

The selection technique was secondly confirmed by a sub-criteria 'Time period – architectural style' to emphasise the value of the original project:

Designed and built between the end of the Monarchy and the 1st Republic: six eclectic *liceus* buildings, designed by architects who have had training in the French *École des Beaux Arts*:

1PN *Liceu* Pedro Nunes - one of the three Lisbon *liceus*, designed by the architect Miguel Ventura Terra, Lisbon;

2RF. *Liceu* Rodrigues de Freitas - one of the two Oporto *liceus*, designed by the architect José Marques da Silva, Oporto;

Designed during the Military Dictatorship - four Art Deco *liceus* buildings, under the 1930s public competition for *liceu* buildings, designed by architects influenced by European inter-war trends and the 1925 Paris Exhibition²³:

3DG. *Liceu* Diogo de Gouveia, Beja, designed by the architect Cristino da Silva;

4FL. *Liceu* D. Filipa de Lencastre, Lisboa, designed by the architect Jorge Segurado;

Designed and built during the 2nd Republic within the '1938 Construction Plan for *liceus*' - 14 *Estado Novo Liceus*, designed by architects working in the government office JCETS-MOP, where a national architectural model was being established, the *Estado Novo* (New State):

5CM. *Liceu* Carolina Michaelis, Porto, designed by several architects;

6DM. *Liceu* da Infanta D. Maria I, Coimbra, designed by several architects.

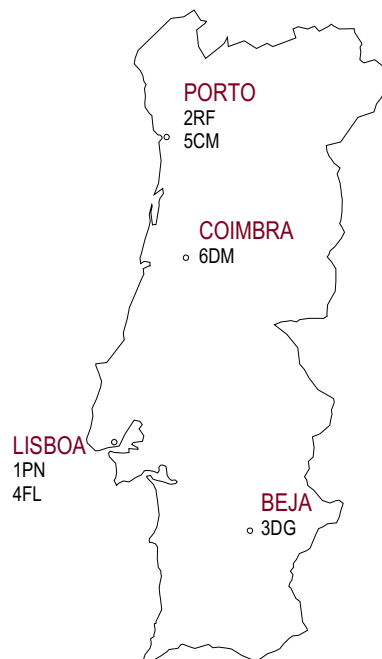


Figure 5.3. Portugal: geographical location of selected case studies.

As discussed previously in the literature review, historic public buildings are heritage places with established cultural significance. Public experience of such places following conservation intervention will take time to develop before enough knowledge and familiarity with the changed space has been accumulated to facilitate comparison with the previous situation. Furthermore, the evaluation of an undergoing process offers an opportunity to 'capture

²³ *Exposition Internationale des Arts Decoratifs and Industriels Modernes*, Paris, 1925.

circumstances and conditions' (Yin, 2009, p. 48) of current thinking on architectural theory and practice.

Research participant selection

Subsequent to the case selection, access to case rehabilitation design documents, heritage listing file archives and sites was granted through mail requests for permission to use, consult and visit, ensuring that the surveys were as consistent and systematic as possible. This deskwork was summarised in six case record forms (Miles and Huberman, 1994) which were informed by specific forms for historic schools (Kelleher, 2007 & 2010, p. 150). Eleven contact record forms were designed per case to summarise information gathered during the fieldwork, to be analysed subsequently. Organised thematically and chronologically, these records were based on English Heritage records for schools (English Heritage and DfES, 2005, English Heritage, 2005, English Heritage et al., 2006) and on other studies on historic schools, for example in Canada (Déom, 2008) and in the United States (CEFPI, 2005), and were used to construct the case studies.

The assessment of a programme requires that the environment upon which it impacts is taken into account (Hawkes, 2001, p. 32), i.e., the physical and the social environment. Tuan (1977) has suggested that place users have intrinsic and unique knowledge about such places, which can be communicated through narrative. This author considers that 'spatial ability becomes spatial knowledge when movements and changes of location can be envisaged' (idem, pp. 68-69), for which the experience of school spaces before, during and after interventions provided spatial knowledge to their users, enabling the comparison between the pre- and post-intervention forms.

Historic school buildings users have a particular type of knowledge about the phenomena studied in this research, cultural significance, which is due to their daily use of the places. As physical users, perceptions of the places' values are cognitively constructed on a daily basis. The time spent is, therefore, proportional to the knowledge gained, and therefore, 'time of use' was a variable to be attended to in the selection process of participants (addressed as a criterium in Table 5.3). Table 5.4 describes participants in the rehabilitation process that were considered acknowledged sources of retrospective data about the pre- and during-intervention stages, and the current post-intervention stage, who were therefore able to provide insights regarding changes in cultural significance. It was considered that school directors were part of the in-between categories, as they represent the owners and, simultaneously, the cultural heritage users.

Categories		Decision Makers		Educational community		
Group Category	Owner	Architect	rehabilitation targeted population			
Participants code	PE	ARCH	SD	S	F	D
Description	Parque Escolar EPE	rehabilitation architects	school directors	students	staff	teachers

Table 5.4. Research Participants: Coding.

Socio-cultural data collected from PE and ARCH interviews was transcribed and data gathered from the education community groups was organised in tables, wordclouds and interview transcriptions. This information was then summarised and included in the eleven contact record forms mentioned above: one per each rehabilitation architect (ARCH), one for owners (PE), and one per case with information gathered from the education community (S, F, D, SD).

5.6 Methods for ERECS

This section describes the procedures used to implement the evaluation tool, by discussing the choice of methods, their design and the fieldwork approach, where a sequential gathering of data was established. According to Mason, tools are tasks to be performed as the term 'refers to specific research protocols to implement a methodological approach' (2002, p. 27). The design of the tools was based on the research context, on the constraints of time, on the evidence required to achieve the research objectives and on the inherent and required tasks to gather evidence, while assuring the key principles of any assessment: to be valid, to be reliable and to be flexible. The following tools demonstrate an understanding of the concepts of cultural significance, rehabilitation design strategies, and change of cultural significance. Each tool was adapted to meet the particular requirements of the research context and timing of the research. The design of practical ERECS tools provide confidence in the quality of the evidence that is to be collected and the judgements that researchers can make on the basis of that evidence.

The general approach to understanding cultural significance change was based on the research objectives and previously established research design, further requiring the definition of methods and measures, so that research 'prior instrumentation' (Miles and Huberman, 1994) is complete before starting the fieldwork. The tools designed to collect data from primary and secondary sources were designed accordingly so that a sequential gathering of data could take place, enabling the analysis to take place along the data collection. The question on which sequence to follow in the fieldwork, was answered by establishing that actions with key participants would follow a sequential order according to the expected impact of interventions: firstly the targeted population of rehabilitation and secondly the decision-makers. The second group was approached, again, in a sequential order: first school directors, followed by architects and finally decision-makers. This sequence of actions aimed to collect raw data from those with the most time experience of a place, who theoretically know the past and current place values. The description of the fieldwork explains how each method was applied and how it informed the analysis which followed. The following sections describe the data collection phase, where theoretical indicators were used to elicit data on places values. This research used a dual methodology by choosing to use secondary sources and primary data, in this same order.

5.6.1 Generating Data from Secondary Sources

This retrospective research, conducted after rehabilitation interventions had been finished, was strongly supported by secondary sources consisting of already produced data, either contemporary or historical, focusing on design documents related or inherent to the original design of the buildings and to the architectural conservation process. This data, particularly that gathered in libraries, websites and the National Heritage Archive, offered general background information and was helpful in contextualising the research. By providing access to historical data, comparisons with primary data can be useful in supporting, or rejecting, an argument or theory presented today by participants. The project documents used are reliable, as they were provided by the authors of rehabilitation design themselves, and they are additionally valid for this research, as the provided texts briefly describe the places before interventions took place, highlighting what architects most valued at the time in historic *liceus*, and describing the predicted values of the place after the interventions. Table 5.5 below illustrates the methods applied according to each type of data source, and the type of evidence gathered to inform each stage of the assessment.

Site of data collection	Sources	Data collection tools	Type of evidence
Libraries	Published sources	Notes	Pre-rehabilitation socio-cultural values (architecture, education)
Websites	Heritage databases		
National Heritage Archive	Listing records		
Architect	Architectural survey	Computer Aided	Pre-rehabilitation material values
Parque Escolar archives	Rehabilitation projects	Design	Post-rehabilitation material values(outputs)

Table 5.5. Case study deskwork: collection methods of secondary data.

Design analysis, required for the pre- and post-rehabilitation stages, aimed to gain insight into the process of design change by analysing rehabilitated buildings, as the output of the creative process and then by understanding the underlying ideas and principles of design (Leupen et al., 1997). The observation of physical traces (Zeisel, 2006) is a method from environment behaviour studies that was adapted and used as a research tool, systematically comparing plans, photographs and site survey notes, to understand decisions made about the place by architects. Diagrams were compiled from annotated plans, recording adaptations made to the buildings and sites, and used to identify the changes to the characteristic elements that provide identity to historic *liceus*, such as functional-spatial layout.

The architectural analysis used two reduction techniques to omit irrelevant data: morphological reduction, to bring to light the cases' spatial structure, and typological reduction, where a diagram underlines the functional relationships of the architectural type *liceu* (Leupen et al., 1997, p. 206). The resulting analytical drawings helped to identify the changes undergone on site (see Figure 5.4) and buildings (see Figure 5.5) as a result of architectural rehabilitation.

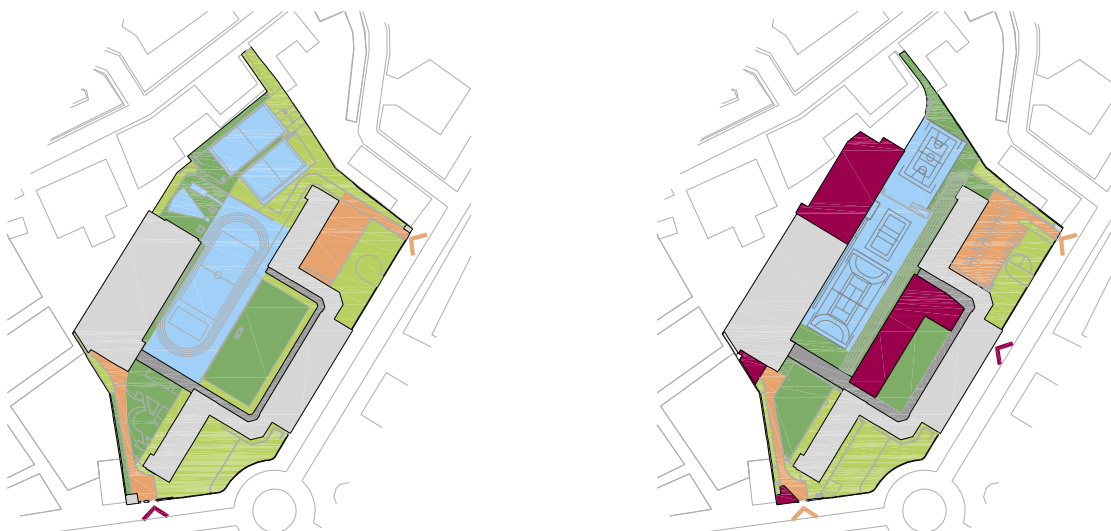


Figure 5.4. Analytical drawings showing the site of 1PN before and after rehabilitation: building(s), spaces and functions.



Figure 5.5. 1PN: Analytical drawings showing Level 1 Plan before rehabilitation: spaces and functions.



Figure 5.6. 1PN: Analytical drawings showing Level 1 Plan after rehabilitation: spaces and functions.

These maps can contribute to an understanding of how landscape and architecture have or have not changed, and also contribute to determining what causes such effects. Triangulating primary and secondary source data can shed some light on preliminary findings by comparing and contrasting these results with information gathered from research participants.

5.6.2 Collecting Data from Primary Sources

The gathering of original data from primary sources requires the establishment of fieldwork procedures such as questionnaire administration, conducting interviews or making observations. The participants in this research are the sources of knowledge on the values of historic buildings and on the rehabilitation design strategies, who informed the researcher about the process of change in *liceus'* cultural significance. Participants were selected from the group of *liceus* stakeholders in the adaptation process, as identified by Almeida, Blyth, Forrester et al. (2010): the design team (architects, landscapers and engineers); the users

(school board, teachers, staff, students, parents and community); and the owner (*Parque Escolar*).

As described a, group sampling method was used and individuals were chosen with similar experiences 'to uncover diversity within a particular group of individuals initially selected because of their similar characteristics' (DePoy and Gitlin, 2005, p. 162). This method helps to minimise differences between individuals, as the participants' roles in the built environment were the same. However, among the group of users, six types were identified. Those that use the buildings on a daily basis are students, staff (i.e., non-teaching staff), teachers and school direction members. Parents use the buildings much less frequently, as do alumni who may never return to their secondary school. The local community may also use the school facilities, and it is common to use the sports facilities or auditoriums after class times. However, they have partial experience of the building. Furthermore, the most directly targeted population of rehabilitation are those who work in the buildings. Therefore, among users, three groups were identified as insight sources for this research: teachers, staff and students. The following survey tools were specifically developed to gather data from these groups.

Survey Questionnaires

Staff and teachers' evaluation, beliefs and perceptions regarding values, interventions and values change were gathered using a self-completion questionnaire (see the Appendix). The construction of these questionnaires followed the suggestions of De Vaus (1996) and other authors on social research methods (Bernard, 2000, Newing et al., 2011, Bryman, 2008, Silverman, 2005, Oppenheim, 2006).

Noting that, and according to one school director, 'the questionnaire survey type is always very difficult among teachers' [1PN_SD], it is an assessment method which helps to identify people's perceptions of urban built heritage and therefore of its value (Tweed and Sutherland, 2007). Having been also used in the context of SEA (Social Environment Assessment) and EIA (Environment Impact Assessment) (see Chapter Three), the tool examined groups of cultural significance and collected social background information, relevant to understanding the research social context and perceptions.

Most of the questions for these two groups of users were identical; only some were different, which took into account respondents' specific work in the building. For example, teachers were asked about their use of the building as an education resource (Q17D) and members of staff were asked about expressions of vandalism in the building after rehabilitation (Q24F).

Factual questions use the 'participant as an informant, observer or reporter about some past event, current status or possession, or future behaviour' (Oppenheim, 2006, p. 147) for which participants were used as intermediaries between the researcher and the information needed for this research. However the author suggests that non-factual questions, on matters such as awareness, values, perceptions, opinions, beliefs and attitudes, need more than single questions, for which, at the end, the questionnaire included open-ended questions for free-responses, aware that these 'are often easy to ask, difficult to answer, and still more difficult to analyse' (idem, p. 113). In addition to open-ended questions, closed-ended questions were used such as Yes/No questions, multiple choice questions and scaled questions. The use of a Likert-style scale in closed questions (e.g. Q14.1/2) provided participants with a list of pre-established values attributed to historic *liceus* in the literature.

The research assessed the change of values for which, as previously mentioned, participants needed to have experienced the place before and after the process of change occurred, so that they could compare both situations and provide comparative data. It should be noted here that all of the interventions took place while the school was open and working, which is believed to enhance the appreciation of the work done, for 'time of use' is an assessment variable where two contingency questions (Bryman, 2008) were used to capture the adequacy of the participant and the reliability of data (e.g. Q01 and Q02). Some answers identified participants who were willing to participate but had not worked in the schools before the rehabilitation interventions had taken place, thus their questionnaires were not considered. Table 5.6 below shows the amount of time that participants have been using the case study locations, and establishes, for each case, the reliability of the information gathered in this research.

Questions	Q01	Q02
Participants (case study_groups)	First year working in this school (range)	Amount of consecutive years working in this school (main range in years)
1PN_Teachers	1991-2005	Mainly 5 to 9
1PN_Staff	1976-2006	Mainly 10 to 14
2RF_Teachers	1971-2005	Mainly over 20
2RF_Staff	1982-1995	Mainly between 15 and over 20
3DG_Teachers	1983-2007	Mainly over 20
3DG_Staff	1974-2007	Mainly over 20
4FL_Teachers	1976-2006	Between less than 5 to over 20
4FL_Staff	1972-2006	Mainly 15 to 20
5CM_Teachers	1975-2006	Mainly over 20
5CM_Staff	1974-2007	Between less than 5 to over 20
6DM_Teachers	1974-2007	Between less than 5 to over 20
6DM_Staff	1982-2007	Between less than 5 to over 20

Table 5.6. Participants 'time of use' in all the case studies (N=176; NT=97 and NS=79).

Administration of the questionnaires in schools took into account the nature of the participant groups, the number of participants, and the amount of time and money available for gathering the data (De Vaus, 1996). Oppenheim (2006) believes that self-administered questionnaires, presented to participants by the interviewer/researcher, have the probability of a high response rate, of providing accurate sampling, and of mitigating interviewer bias in participants' answers. However, the author also suggests that a clear briefing should be given to participants, for which a participant information sheet (see Appendix) was given along with the questionnaire.

In general, specific demographic questions were asked in the last part of the protocol, following established questionnaire design principles (Oppenheim, 2006). This data is important to assess the representativeness of the participants. Table 5.7 below shows that participants' age ranged from 34 to 63 years old, with gender information also indicating that teachers and staff in *liceus* are mainly women. Cases with older teachers provide better opportunities for oral transmission of schools' older values than the others, such as 3DG.

Questions Participants (case study_groups)	Q26 Age (the youngest - the oldest)	Q27 Gender (male per total group participants)
1PN_Teachers	49-58	3 /15
1PN_Staff	34-58	3 /14
2RF_Teachers	42-62	1 /20
2RF_Staff	46-61	2 /8
3DG_Teachers	35-59	6 /19
3DG_Staff	34-62	7 /22
4FL_Teachers	45-63	1 /13
4FL_Staff	39-60	1 /10
5CM_Teachers	47-63	2 /14
5CM_Staff	38-58	4 /14
6DM_Teachers	51-59	3 /15
6DM_Staff	43-63	5 /12

Table 5.7. Demographic data of teachers and staff in each case study (N=176; NT=97 and NS=79).

A pilot study was conducted on 22 March 2011 in the first purpose built *liceu* in Portugal, *Liceu* Passos Manuel (OPM) with the formal authorisation of the Portuguese Ministry of Education. The purpose was to test the questionnaires, the teachers' and staffs' understanding of the questions, their reactions and opinions, and also to pilot the interview. As this *liceu* fulfilled the criteria to be selected as a case study (from the first architectural style period), the information gathered was used at some points of the analysis and discussion to illustrate specific issues. However, it was not used as a case study (as explained in section 5.8)

The procedures to engage users' participation, to write the information sheets and, most importantly, to pilot the questionnaire, were tested, enabling the researcher to refine certain questions and measure the time required for its completion. Administration and pick-up were made in person by the researcher in order to gain cooperation and motivation so that the response rate could be maximised (Oppenheim, 2006). However, some caution has been recommended in the interpretation of the data gathered using this method considering that, 'if people are aware that they are participating in a survey or an experiment, this in itself will often produce certain changes – they become more alert, they develop expectations about the outcome, and with all the attention they are receiving they may try to 'respond' extra-well' (idem, pp. 29-30). The results of the pilot survey informed the researcher of the need to mitigate 'extra-good answers, to reduce the length of the questionnaire and to reword and reorder some questions to ensure best results.

Acrostic Poem

Access to school children is a sensitive topic (Oppenheim, 2006). For this reason, a specific tool needed to be found, or designed, so that direct contact with students could be avoided, as required by the ethics committee. Therefore, during a visit to *liceu* Passos Manuel – one of the projects commissioned to the researcher's own practice, which soon became the pilot school (OPM) – an acrostic activity fixed on the school walls provided the inspiration to use this tool as a research instrument, although it was later found to have already been used in research in educational environments (Kishore, 2011). Acrostic poems, which students are used to doing from primary school in Portugal, is a pedagogic activity using 'blank verses in which the letters of a concept, label, key word or a topic begin with words, phrases or sentences that are continuous from one line to another' (p. 150). This tool was developed for the present research and supported theoretically by the 'wish poem...' structure designed by Sanoff for school buildings' assessments, who considers it to be a method to encourage 'stakeholders to discover and reflect upon the physical features of a school building' (Sanoff, 2001, p. 1). The tool is a creative exercise, which requires students to play with a limited vocabulary and first-lettered words of the given term, as they are limited to start each line with a specific letter.

The acrostic involves an open-ended question where, through the use of the word *liceu* (secondary school) and the word *escola*, (school), students were asked to describe the educational place, before and after rehabilitation interventions, respectively. This tool enabled the students to reveal what they most valued in their educational environment and gather their perceptions, which were expected to provide useful qualitative data on the physical environment. The notion given of 'before' and 'after' differed from the youngest to the oldest students, because the youngest were in their first year of experience in a secondary school and the oldest were nearly leaving secondary education. Therefore, data was collected amongst the youngest (7th grade – 12 years old) and the oldest (12th grade – 17 years old) students, one class per year, in each school. An introductory explanation asked them to fill in their perceptions of what the school was like before and what it is like now: the youngest were asked to refer to the situation of *liceus*, long ago, before the 1974 Portuguese Democratic Revolution; the oldest were asked to refer to the situation they knew before the intervention took place. It was later found that acrostics verses had been applied at a similar school level among a similar group of students (N=25; Age: 14-15 years) (Kishore, 2011).

The acrostics were designed to be administered face-to-face by the class teacher, with clear implications for the type of answers received. Responses to this activity were expected to be

phrases, as the academic activity requires. However, the majority of responses were written in single words in each line. Furthermore, it was expected to reveal the physical elements of the school, as they were the ones that visibly changed with rehabilitation. Conversely, students revealed a significant amount of values related to the socio-cultural environment.

Open-ended interviews

An open-ended interview, as opposed to a semi-structured interview or a structured interview, requires active listening, the establishment of a relationship of trust with the interviewee by attempting to understand their point of view, and, most importantly in qualitative research, flexibility from the researcher to adapt to unexpected issues (Silverman, 2008). The interview was designed around three sequential topics, as data gathered via this method has better reliability and credibility than interviewing participants with no previous preparation.

In order to give interview participants the freedom to talk about values and ascribe meanings to places, the researcher identified at the beginning of the interview the three main topics to be discussed, and participants led the exchange as a conversation where someone is really interested in describing what happened and someone is interested in listening to that description. This method can be categorised as naturally occurring talk, where the narrative gives accounts by using local cultural resources (Silverman, 2003). In order to examine what people actually do (Silverman, 2008), this data can be analysed as specially recorded instruments, like transcripts, providing an insight into attitudes, values, interpretations of events, experiences and opinions.

The interview used another method to access perceptions of values. Sanoff (1991) used photo interviewing as a technique for eliciting evaluative comments from users about their built environment. This method provides information on the physical features from which school users construct their community values, and provides perceptions of their interaction with the buildings. In these research interviews, at the end, all interviewees were asked to make a mental picture, a virtual photo of the school, at two moments in time: before and after the intervention. The imaginative scenario given to the interviewee was of a relative living far away, to whom he/she wanted to show what was different in the school where they work now following the rehabilitation and for which two photos could be taken to send: before and after the intervention. This question shed some light on the definition of 'change' for each participant regarding 'their school', either as a director, as the architect, or as the owner.

5.6.3 Conducting the Fieldwork

Contact with participants in schools was made by mail and telephone via gate-keepers (Robson, 2000, Jupp, 2006), i.e. elements of the school Direction, early in February 2011, as soon as ethical approval was granted (see section 5.8). Formal letters were then sent out and, in each school, Directors gave permission for the research to be conducted on-site. Only one school showed limited enthusiasm for the research. Follow up e-mails were systematically sent after each visit to a school or after receiving any information by e-mail.

Fieldwork Timing

This research needed to take place in real world settings, where phenomena could be observed with no manipulation from the researcher, and where, as a process observed in public buildings, the political and temporal context in which the data would be collected would have a limited effect on the research (De Vaus, 1996, p. 346). The fact that the political context in Portugal changed on 5 June 2011 dictated the period for the data collection.

Questionnaire and acrostic data were gathered on-site between 31 May and 3 June, just before the academic year ended. Site surveys were conducted between 22 August and 12 September 2011, just before the new academic year started. The survey took place during the summer vacations. This meant that students' behaviour could not be observed but that the place could be examined as material cultural, from the original design and the rehabilitation intervention. Furthermore, access to all spaces²⁴ to observe 'as built' projects was facilitated. Photographs were taken at this time, focusing on the identity elements of the physical space of each *liceu*, such as the characteristic spaces of a secondary school (the main staircases in 1PN, 2RF, 4FL), elements of architectural style (the Art Deco clock and signage on the main facade of 3DG), or evidence of a construction system (the round Modernist shape on 4FL). Notes were taken on project drawings of observed issues, such as changes in function or evidence of vandalism. The researcher's observations were supplemented by comments from the staff members assigned by the school directors to guide the researcher, facilitating contact with teachers and staff, and literally opening up all of the doors of the school, providing an essential contribution to this research.

Interviews were conducted from 28 September 2011 until 6 January 2012, just two months before the *Parque Escolar* administrators resigned. The sequence established that the school

²⁴ In 5CM, the researcher was given the master key to open all the doors. This demonstrates a feeling of confidence in the researcher, which should be noted as the result of a trusting relationship with the School Director.

directors would be the first interviewed, followed by the architects and finally the owners' representatives, following a decision-making sequence. It was perceived that although the directors had collaborated in the design of the brief, it is up to the architects to make their briefs possible and to the owner to have a final word on the design proposals.

Fieldwork on the sixth case study (3DG), the construction period of which was delayed for one year, took place in April 2012, ensuring the same timeframe of experience of the rehabilitated *liceu* for all research participants.

5.6.4 Data Analysis Methods

This section discusses the multi-strategies used to handle data, to analyse qualitative and quantitative data, and to describe short-term change of cultural significance and what this fact means for the long-term sustainability of architectural heritage significance. Firstly, based on the completed questionnaires and acrostics, a structured data matrix of value attributes (De Vaus, 1996) was built for each case study in which the participant's answers were inserted. The main findings of the acrostics and questionnaires were related to the appreciation of the value of the historic *liceus* by their users, as contemporary places of education and as results of heritage rehabilitation. These tools further informed about the outcomes of rehabilitation by collecting information on feelings, opinions and behaviours. This process of empirical research is considered to infer abstract inductive theoretical thought from concrete experience (Knight and Ruddock, 2008). Theory, as the 'explanation and prediction of things' (Bernard, 2000a, p.74), is therefore at the origin and the end of this research.

Initially, the analysis of acrostics data was established to be quantitative, counting frequencies and mapping themes most referred to. Visualisation of the most frequently used words was achieved using the software Wordle – a supplementary research tool (McNaught and Lam, 2010) which produces wordclouds. By visualising text in a hierarchical mode, using different font sizes, this was a useful tool for preliminary analysis of the main topics in written format. However, the full text is not preserved as it analyses the frequency of words, and words are removed from their specific context, i.e., Wordle treats each word as a unit of analysis. To understand the meanings carried by words, another tool was used: content analysis (Berg, 2009; Denzin and Lincoln, 2003; Oppenheim, 2006). Therefore, two methods of analysis were used to assess data on material and immaterial values ascribed to *liceus* by students pre- and post-rehabilitation intervention.

As for open-ended interviews, thematic narrative analysis was used and a thematic conceptual matrix (Miles and Huberman, 1994) designed, highlighting the unpredicted values ascribed by participants to historic *liceus* and to rehabilitated historic *liceus*. A specific interview schedule was used as a guide (see Appendix) as the description of life experience is needed in narrative analysis. This type of analysis, which can be applied to case study research, highlights how 'the author and others value events, characters, and elements differently' (Boje, 2009), enabling patterns to be ascribed to events and to identities across cases. In narrative inquiry, the analysis of qualitative material is made interview by interview, 'rather than locating distinct themes across interviews' (Chase, 2011, p.424).

In summary, the analysis of the data gathered follows the three phases of the ECRES tool, with three assessment phases established:

1st Input Phase: Establishing Cultural Significance

The analysis of tangible values before interventions is mostly based on texts – heritage records, written texts, drawings and photographs – where categories are visually identifiable and measurable. Through the use of comparison methods, the interpretation of results is crossed with data gathered from research participants. On the other hand, the intangible values of each place were established through the interpretation of participants' narratives on the historic places before interventions. For example, when assessing acrostics, the method used was content analysis where the most used words were counted.

2nd Planning Phase: Establishing Informed Design Strategies

In this phase, the evaluation aimed to assess how existing values were considered in the establishment of design strategies. The narratives regarding the physical description and the socio-cultural description of the existing physical environment, and of the proposed 'new' environment, were analysed. The aim was to find if international principles of rehabilitation interventions were used to establish strategies for the enhancement of pre-existing values or if other principles had been used. The oral descriptions were later cross-checked with the originally written descriptions produced during the design stage to find if strategies had changed since the original idea.

3rd Output/Outcomes Phase: Evaluating Cultural Significance Change

This phase analysed how design strategies altered the physical environment, and which contributions were made to a socio-cultural environment of the rehabilitated historic school. The levels of change achieved in each case, either beneficial and adverse, were established

based on material comparisons, observed in site visits, to conclude the rehabilitation outputs, i.e., material values change. As for immaterial values change, analysis of how users describe their working environment today facilitated the understanding of the effects of rehabilitation on users, i.e., outcomes one year after completion.

In summary, the data analysis mainly used content analysis (Walliman, 2005, Berg, 2009, Denzin and Lincoln, 2003) methods to categorise data by classification, summarisation and tabulation, either from texts, drawings or photographs, and to unveil new categories. A thematic approach to categories and sub-categories of values was followed. The research findings are presented and discussed in the next chapters according to the main categories of values – material and immaterial – and to design strategies, all complemented with value-specific attributes that emerged during the analysis. Occasionally illustrations are provided, such as quotes or numbers, to demonstrate, inform or support findings.

5.6.5 Reliability and Validity

During the data collection stage, the use of specifically designed protocols for conducting the interviews, questionnaires and acrostics, and the previous validation of the raw data, contributed to the reliability of the research (Yin, 2009). However, and acknowledging that research reliability refers to the degree that the application of the same research technique to the same object/subject is expected to provide the same result, when the evaluation tool assesses values, a subjective and contextual topic (see Chapter Two), it is only possible to assure each assessment's reliability at a specific moment, for a specific group of participants.

To increase the validity of this research design, multiple sources of evidence were used in the data collection stage, establishing a chain of evidence and enabling triangulation of data when analysing the data (Yin, 2009). For example, in the case of material values, the combination of results from a questionnaire and from an interview may support and confirm the results observed from analysing project drawings. The analysis followed the identification of patterns and built explanations for such patterns applying logic models (Yin, 2009). As for external validity, Yin's (2009) suggestion to use replication logic in multiple-case studies was followed, as previously mentioned.

The flexibility of this research design was revealed to be a strength. During the process, the research questions changed, embracing more deeply the significance of places and becoming more focused on the values and design elements to be analysed. The design was kept

appropriate for assessing specific case characteristics and for the inclusion of others which were encountered as the analysis progressed.

5.6.6. The Tool: Evaluation of Rehabilitation Effects on Cultural Significance

In summary, Table 5.8 below synthesises the ERECS tool by establishing the conceptual framework of each stage in a process of change, the operational definitions and their categories, and fieldwork methods for gathering and analysing data on the effects of the architectural rehabilitation of historic buildings on cultural significance.

Concepts	Cultural Significance		Sustainable Rehabilitation Design Strategies	Cultural Significance Change	
General Conceptual definitions	Aesthetic, historic, scientific, social or spiritual value for past, present or future generations; Considers tangible and intangible dimensions of place; Relative significance: integrity and authenticity Historical connections (ICOMOS Australia, 2000) and contemporary relationships (ICOMOS Australia, 2013)		Follow international guidance Include users knowledge in design decisions	<i>Adverse effects:</i> Loss of pre-existing values Mitigation of pre-existing values <i>Beneficial effects:</i> Retain significance (ICOMOS Australia, 2013) Enhance of pre-existing values Addition of new values	
Operational definitions	Cultural Material values of historic building	Social immaterial values of historic building	Respect values authenticity Preserve fabric integrity Enhance physical condition Assure reversible interventions Update functional use Add contemporary layer Conducted by expert architects	Cultural Material values of rehabilitated building	Social Immaterial values of rehabilitated building
Categories	Townscape Landscape Architecture Contents	Sense of place, continuity and community	All the previous	All the previous	All the previous
Fieldwork	Historic documents/projects Users of place Building owner		Project Documents Rehabilitation architects Historic building owner	Site Users of place Historic building owner	
Data sources					
Gathering Method	Archives	Archives Questioning	Architectural Offices Questioning	Site survey	Questioning
Gathering Tool	Drawings reduction (morphological and typological)	Interview Questionnaire Acrostic Poem	Interview Text reduction Drawings reduction (morphological and typological)	Observation Photograph	Interview Questionnaire Acrostic Poem
Analysis Method	Comparative and interpretive (identifiable / measurable elements)	Interpretive narratives and values Count words Identify themes	Comparative/measure content Interpret narratives	Comparative with previous to establish change; Identify effects types	Compare with previous to establish change; Identify effects types

Table 5.8. ERECS: Conceptual Framework, Operational Definitions and Fieldwork.

5.7 Testing ERECS

This section briefly summarises ethical considerations, practicalities and constraints regarding how the research was conducted by a practitioner in the real world (Robson, 2011) including a reflection on the role of the researcher.

5.7.1. Ethical Considerations

The research followed the most important principles of ethics: informed consent, confidentiality, voluntary participation and anonymity. Approval to conduct the questionnaires in the selected educational environments was obtained from the Portuguese Ministry of Education and from the Oxford Brookes University Research Ethics Committee. Permission was further obtained from the schools' directors to use the acrostic poem tool with their students, with the pre-agreement that teachers would deliver surveys to students, avoiding direct contact with the researcher.

All participants gave voluntary informed consent. Interviewee consent sheets were signed and are kept safely locked in Oxford Brookes University, along with the questionnaires, acrostics and audio records of conversations, complying with the University Ethics Regulations. In the data reduction stage, codes were used to identify informants in order to ensure confidentiality and anonymity, so that in the data analysis and data reporting, the focus is on evidence provided from socio-cultural group members and not on the individuals. However, the information regarding decision-makers – rehabilitation architects, school directors and PE members – is in the public domain.

5.7.2. Practicalities

Practicalities were carefully considered when developing the research design of primary research, with a focus on the cost and time required for the number of cases and the number of participants required. In 2007, the researchers' office was commissioned to rehabilitate three secondary schools in Portugal under the SMP, which gave her a privileged insight into some potential problems and constraints for the testing of the tool. Traditionally, the value formation in the establishment of the significance of a site, or building, relies on the perceptions gathered by experts (Mason, 2002) – a method that has been considered 'inadequate' (Mason and Avrami, 2002, p. 22) as it is not inclusive of others' opinions, and

enables experts' bias to affect the assessment and interpretation of heritage values. Although assuming that the practitioner-researcher cannot be completely apart from the professional knowledge gained in practice, and considering that fact to be a potential strength of the research, the research followed the suggestion of William Freudenburg, as pointed out by Mason (2002, p. 16). To overcome the researcher's own biases, a triangulation method was used in which reflection and interpretation, based on research of existing documentary data and on data gathered among participants in fieldwork, enabled the generation of knowledge and the revision of the researcher's own opinions, therefore complementing and continually updating the professional knowledge obtained 'by doing' (Lawson, 2004). The researcher then deliberately decided not to select any of the commissioned projects as case studies in order to avoid personal professional bias in the analysis and evaluation stages of the research. However the oldest purpose-built *liceu* in Portugal (OPM) was used as a pilot case study where access to the school community was assumed to be facilitated, providing a suitable research context for piloting some tool and for developing the researcher's skills before being immersed in the real world of the research cases.

5.7.3. Constraints

Other potential informants, such as alumni, parents or members of the local community could not be included in the research due to time constraints. This fact anticipated that data would probably focus more on the current perceptions of daily users, in the experience of the rehabilitated and the new spaces, rather than on the spaces before interventions. Furthermore, the recent adjustments of public sector reforms in 2008 included evaluations of teachers and the mitigation of retirement conditions. This ultimately diminished the possibility of questioning older teachers who had established deeper relationships with historic schools. This retirement of teachers in this period constituted an unpredictable limitation.

Finally, as this research was conducted in public schools, and is therefore linked to social policies established at a political level (Robson, 2000, p. 28), some political issues could have introduced bias in the participants' responses. That possibility was addressed in the analysis by contextualising information within the political moment of the research. For example, when a student refers to 'luxury' in rehabilitated schools (3DG), they may be expressing an idea disseminated by the media at the time, when the new government was justifying stopping its expenditure on the SMP (for example, in a newspaper article titled 'Unnecessary works and luxury aggravated the invoice of *Parque Escolar*', *Jornal Expresso*, 09.03.2012).

5.7.4 Reflective Thoughts of a Practitioner Doing Academic Research

As a practitioner doing research, it was assumed that the development of an evaluation tool would be influenced by previous experience in architectural conservation, in general, and of different building types. The specific experience in the rehabilitation of historic schools was firstly considered as a strength in this research: practice could possibly contribute to theory by testing theoretical assumptions and by trying to establish tools which could help to implement theoretical principles in practice. This contribution was supported by other colleagues, which confirmed the opportunity to conduct this research and reflect on the work done so that lessons learned could be used in further works. In particular, participant architects commented on this topic during the interviews, demonstrating that they felt comfortable conversing with their peers, confirming the suggestion that some information would be better shared with a practitioner researcher (Jupp, 2006).

However, the researcher also experienced some negative reactions to her position in the investigation, as her role was not clear to some participants, who had some difficulties in separating the researcher from the practitioner. For example, when staff participants guided the site survey, they pointed to some physical or functional problems, misinterpreting the power of the researcher in the solution of the identified problems. Furthermore, the researcher herself felt the difficulty of shifting from the practitioner role to that of researcher – an option conscientiously made for the benefit of a focus on the contribution to knowledge, to other architects' practice and with the aim of drawing attention the changes required changes in the management of architectural heritage.

Firstly triggered by the *Faro Framework Convention* (Council of Europe, 2005), i.e., by the increasing recognition of the importance that architectural heritage has for societies and the role of societies in the sustainability of heritage, and secondly by the greater responsibility that was being given to the architect in assuring that significant values would be preserved and enhanced with their rehabilitation interventions, this research aimed for a practical application of the knowledge that would be created. An example of the professional responsibility felt in practice, and of the perceived unawareness of the heritage values inherent in a historic educational environment, took place when movable heritage materials, used in education for decades, were found on sites such as individual wooden desks, maps, scientific objects, and zoological specimens collections. Educational heritage is a whole that should not be taken apart. As an architect, the researcher strongly felt the responsibility towards the preservation of these materials on-site, and not just the commissioned building, as significant elements of

the original educational environment, while introducing the requirements of the New Learning Environments (see Section 3.3.1). In the researcher's experience, this perspective was generally difficult to be understood, developed or even implemented by owners and users, highlighting the lack of a supporting tool for an integrated decision-making process.

5.8 Summary and Chapter Conclusion

This chapter explained the mainly qualitative methodology applied in this evaluation tool, specifically designed using a case study approach, in order to test if, in a context of rehabilitation of historic buildings, the value of design strategies for the sustainability of cultural significance of architectural heritage can be established through the use of an evaluation tool. The design followed the ToC model, which was adapted to the strategies considered appropriate to elicit the required information. The methods and the sequence of actions established to enable the researcher to gather empirical evidence from fieldwork were discussed, as were the methods used for the analysis and interpretation of qualitative and quantitative data.

The following chapters discuss the findings from the test of the ERECS in three stages of empirical research, making the case for the need and effectiveness of the tool. Firstly, by determining the recognised and used cultural values of historic *liceus* before interventions for which archival analysis, reviewing historical documentation and surveys were used to gather qualitative data on material and immaterial values (Chapter Six). Secondly, by explaining the design process and providing an understanding of the ethics and methods applied by architects in establishing architectural design strategies to rehabilitate historic *liceus*, for which archival documents from the project were collected and analysed, along with interviews with decision makers involved in the process (Chapter Seven). Finally, by identifying the short-term effects of rehabilitation design strategies on the cultural significance of historic *liceus* i.e., determining the outputs and the outcomes of interventions in relation to previous significance, by analysing settings surveys, teachers and staff questionnaires, interviews with directors and students' acrostic poems (Chapter Eight). The last chapter (Chapter Nine) brings together the conclusions from each analysis chapter, synthesising the contribution made to knowledge on the relationship between architectural rehabilitation theory and practice in the case of historic school buildings in Portugal.

Chapter Six. Establishing the Values of Historic *Liceus* in the Early Twenty-First Century

6.1 Introduction

The purpose of this chapter is to address the third research objective, which is to test the first phase of the designed evaluation tool ERECS by identifying the cultural significance of historic *liceus* in the early twenty-first century, before architectural rehabilitation interventions. It is argued that historic *liceus* designed before 1950, although having different periods of significance, contribute to the history of a country's architecture, education and society, which makes them eligible for heritage listing, as a protection measure to safeguard their values. The reasoning followed in this chapter considers that in the early twenty-first-century, the cultural significance of a place is still only ascribed by historians with no consideration of the values of the users of the historic environments as heritage theory strongly suggests (see Chapter Two). Therefore, and considering a holistic gathering of evidence, three categories of historic *liceus* values are addressed as found in the literature review, according to three phases of the sites' historical time line (Feilden and Jokilehto, 1998, p. 2): the original design, developments, and in the early twenty-first century.

The proposed tool breaks down significance into three constituent types of cultural significance: historic significance (section 6.2), design significance (section 6.3) and sociocultural significance (section 6.4). Recognised to be 'heterogeneous in terms of building types, architectural features and quality' (Heitor, 2008b, p. 1), historic *liceu* buildings need to be assessed individually. Therefore, the methodology used to assess their significance follows a cultural approach, including comprehensive historical research and significance analysis. They are also assessed retrospectively, and viewed in the context of the time before the rehabilitation construction started. The next section (section 6.5) analyses the heritage values recognised by public authorities and the next section (section 6.6) provides some reflective thoughts on the use of the ERECS tool for gathering inputs for rehabilitation interventions. The chapter ends with a summary of the conclusions, demonstrating the historical, architectural and socio-cultural values identified as being recognised and used when establishing the cultural significance of historic Portuguese *liceus* at the beginning of the twenty-first century.

6.2. Historic Values

The purpose of this section is to establish the historic values of historic *liceus* as the result of the socio-cultural context within which each *liceu* was originally designed and built, i.e., at their original period of significance. Although grouped by architectural style, the findings indicating the most distinctive features are presented individually. As the term '*liceu*' is used indistinctly for an institution, a site and a building typology, the following Table 6.1 summarises some of the characteristics of the case study *liceus*, as institutions and as architectural building types, grouped by architectural style, including the pilot case (OPM).

Building types	Eclectic <i>liceus</i>			Modernist <i>liceus</i>		<i>Estado Novo</i> <i>liceus</i>	
Case-studies	OPM	1PN	2RF	3DG	4FL	5CM	6DM
Location	Lisbon	Lisbon	Oporto	Beja	Lisbon	Oporto	Coimbra
<i>Liceu</i> institution created in	1836	1906	1836	1836	1928	1915	1918
Use of available facilities from	1838	1906	1840	1852	1928	1915	1919
Inauguration of <i>liceu</i> building	1911	1911	1932	1937	1938	1951	1948
Commission	Kingdom Ministry			MIP-JAESS ³		MOP-JCETS ⁴	
Architect	Rozendo Carvalheira	Miguel Ventura Terra	José Marques da Silva	Cristino da Silva	Jorge Segurado	José Sobral Branco	Francisco Assis

Table 6.1. Origins of the *liceal* institution and of the *liceu* building, according to (Nóvoa and Santa-Clara, 2003).

The table above shows the gap between the creation of the institution *liceu*, by Law Decree, and the inauguration of each purpose-built *liceu*. Although it is well known that *liceal* institutions started to operate in non-purpose-built facilities but rather in religious buildings due to the state's seizing of Jesuit properties when they were expelled in 1834 (just two years before the *Liceus* Decree was issued), the span of time between the establishment of the institution and the inauguration of a *liceu* building varies considerably (for example, in case study 3DG it took over 100 years whereas in case study 1PN it only took five years, suggesting a preference for the provision of these facilities in the main cities). The commission of architectural designs moved from the Kingdom Ministry (established during the monarchy, which lasted until 1910) to the State Departments, specially created for the management of the construction of buildings for secondary education. The commissioned architects move

from direct assignments to independent well-known architects, to public competitions winners, and to state department architects, suggesting a progressive increase of control over architecture by the state, as happened in all fields of society in the first half of the twentieth-century in Portugal.

6.2.1. Historic values of Eclectic *liceus* from the beginning of the twentieth-century

The first group of *liceus* to be designed and built since the final stage of the monarchy and during the 1st Republic were named Eclectic and correspond to a timeframe which is referred to as 'pre-1930s'. This group of *liceus* reflect the studies conducted by Portuguese architects in the French *Ecole des Beaux-Arts*, as these authors earned scholarships to study architecture in Paris, where they had the opportunity to observe and understand the conceptual model of the French *lycée* (Moniz, 2007) built after the 1880s. These first *liceus* further reflect the requirements for a healthy learning environment and experiments with new materials and new construction systems (e.g. the case of OPM, in Mestre and Aleixo, 2011c). The new spatial and functional building types initially followed a traditional classic composition which is symmetrical, decorative and monumental. Such was the image proposed by the Portuguese architects Miguel Ventura Terra in Lisbon and José Marques da Silva in Oporto which were heavily influenced by their French experiences. However, a close look reveals a modern attitude towards the buildings.

The two case studies (1PN and 2RF) selected from this period are representative of the small group of six *liceus*, located in the main cities of Lisbon (4) and Oporto (2). The aim is to illustrate how a detailed description of the original context of design of an historic *liceu* can highlight its main historic values.

Case Study 1 (1PN): *Liceu de Pedro Nunes*, Lisbon: 1908-1911



Figure 6.1. 1PN (post. 1909). Source: *Alberto Carlos Lima*; AML, ref.PT/AMLSB/AF/LIM/002636

Case Study 2 (2RF): *Liceu Rodrigues de Freitas*, Oporto: (1918) 1926-1932



Figure 6.2. Main facade of 2RF (1940). Source: IRHU/SIPA, ref.PT011312040293

In summary, these first buildings of a new architectural typology, the *liceu*, are historically significant as only six were built. They also exhibit the development of a new architectural type, based on a religious convent model type, as observed in the seminal OPM (Moniz, 2007). It is recognised that, although sharing a classic background, Ventura Terra and Marques da Silva (along with Raúl Lino) have been considered the first modern architects in Portugal, where their training did not prevent the creation of works 'that only make sense in the framework of the twentieth-century dynamics' (Vieira de Almeida, 1986, p. 16). These recognised architects were directly commissioned to design this new public building type, the *liceus*, contributing to the socio-cultural environment by designing and building unique examples of an Eclectic Portuguese educational architecture with a French influence. Reflecting the spatial and functional requirements of the 1905 Education reform, their contents, in terms of scientific and other educational resources, is significant in a building where the first developments in construction technology were tested in the design and building of this new architectural typology.

6.2.2. Historic Values of Modernist *Liceus* from the 1930s

Modernist *liceus* were designed according to the Art Deco architectural expression in a transitional political period which followed the 1926 military *coup d'état* against the 1st Republic. These designs were framed by an international aesthetic movement which considered that traditional forms of architecture were becoming outdated as new materials and new technologies were available to provide new built environments. The new military dictatorship aimed for a modern aesthetic image to evoke progress and symbolise the future. Public buildings, such as train stations, post offices, and educational buildings, provided

opportunities to display monumental architecture conveying such messages (Rodolfo, 2002). A different way to commission *liceus* buildings, which would bring forth this new ideal of society, would therefore be set out.

By establishing the timeframe for these particular *liceus* buildings between 1926-1936, starting with the 1926 new education policies and ending with the Education Reform of 1936, Moniz suggested this decade as the period when an elitist character appeared to become attached to the *liceu* building (2007). The educational spatial requirements of *liceus* were not changed by the 1926 Reform (Alegre, 2012a), which still remained as established in the 1905 Reform (Moniz, 2004). However, this new reform forbade the co-education of genders, therefore requiring the construction of facilities for girls, as for example *liceu Filipa de Lencastre* (4FL), the second Portuguese *liceu* purposely-built for girls. In fact, the 1926 Decree established that girls' *liceal* education was to be exclusively female. All male teachers from such schools were transferred to other *liceus* in the same cities (Correia, 2003a, p. 619), guaranteeing that students, teachers, and also administrative and non-teaching staff would only be female.

With the purpose of responding to this political context, and within the Public Instruction Ministry, the Administrative Board of the Loan for Secondary Education (MIP-JAEES) was created in 1928 and four public competitions for the construction of new *liceus* were launched. The brief provided guidance documents for the design, detailing pedagogic, hygiene and construction requirements, as were perceived to be needed in a modern *liceu* (Alegre, 2012a). The results of the competition were published in the architectural magazine of the time, in 1931, under the title 'Modern *liceus*' (Cristino da Silva, 1931), showcasing that Portugal was up-to-date in a global context. The design proposals showed the rigorous geometry of Modernism (Toussaint, 1998), made possible by the characteristics of new materials, such as reinforced concrete. This enabled architects to take advantage of simple volumes, geometry and structure as aesthetic elements. This modern style was influenced by the above-mentioned 1925 Paris *Exposition*, aligned with the European Art Deco movement, combining rationality, functionality and formal simplicity, while rejecting the use of traditional materials. With an absence of guidance or control of architectural expression by the *Estado Novo* Regime (Teotónio Pereira, 1987), this period allowed architects the relative freedom to design what they believed to be the most appropriate style for new building type. However, this period was about to end (Moniz, 2005). Traditional values imposed by the dictatorship would soon overcome the initial adherence to Modernism.

As a consequence of the four competitions, four *liceus* were designed and built in the 1930s, of which three are clear Art Deco buildings. Two of these *liceus* have been rehabilitated under the SMP, and were therefore selected as case studies for this research.

Case Study 3 (3DG): *Liceu Diogo de Gouveia*, Beja: 1930-1936



Figure 6.3. The main facade of 3DG (circa 1936). Source: IRHU/SIPA, ref.PT040205150078

Case Study 4 (4FL): *Liceu Filipa de Lencastre*, Lisbon: 1932-1938



Figure 6.4. 4FL (1958). Source: IRHU/SIPA, ref. IPA.00007785/FOTO.00674070.

In summary, *liceus* buildings from this period are historically significant because they are rare examples of Modernist architecture in public education facilities, with only three examples. They were designed by recognised Portuguese architects, and they express education philosophies of the transitional period, between the monarchy and the 1933 Dictatorship. Developments in construction technology, such as the use of reinforced concrete, were here used by the architects, who explored the aesthetic potential of the materials in a period when a new aesthetic mode of expression was being sought by the state.

6.2.3. Historic values of *Estado Novo liceus* from the '1938 Plan'

This period encompasses the *Estado Novo liceus* designed and built under the 'National Plan for new *liceu* buildings, extension, improvement and/or completion', known as the '1938 Plan', before the 1948 publication of the New Statutes of *Liceal* and Technical Education. After the 1933 Constitution, establishing the *Estado Novo* dictatorship regime, this plan was set out as a reaction to the architectural expression of the previous *liceus* (Moniz, 2005) and the need for the provision of more facilities for *liceal* education. In 1936, the Ministry of Public Instruction was renamed the Ministry of National Education, creating the National Board of Education to follow stronger policy regarding 'ideological pedagogic and moral nationalism, expressed in the motto *Deus, Pátria e Família* (God, Fatherland, and Family)'. The 1936 Reform, which would last until the 1970s, considered *liceal* education to have 'the specific objective to provide the Portuguese with a general culture, useful for life' (Parque Escolar and Alegre, 2010, p. 23). One of the first measures taken to control the large number of students in *liceus*, was to oblige students to take an admission exam, and to encourage an optional education route. As overpopulation of *liceus* and universities needed to be prevented, students were to be distributed between *liceal* education and vocational technical education, establishing a social hierarchy among secondary level students. With the education system focused on these ideals, educational facilities were suitable political vehicles for their transmission and dissemination.

In 1934, the Board for the Construction of Technical and Secondary Schools within the Public Works Ministry (JCETS-MOP) was created, replacing MIP-JAEES, to implement a plan for the design and construction of *liceal* and technical schools. However, the authorship of these *Estado Novo liceus* has not yet been clearly identified, as private commissions for the development of a preliminary design were followed by the JCETS architects' alterations, which would adapt parts of the design to the image established by the regime. In search of a unique nationalist architecture, authorship was not valued in this period, with a focus on the outputs of the design as the important contribution to significance rather than on the creator or the author of the original design.

Over time, the importance of the *liceus'* outdoor spaces design increased, acknowledging the relevance of such spaces for educational and social purposes. However, this perspective was mainly motivated by the political requirements of the *Estado Novo* regime. As set out in the 1936 Education Reform, the *Mocidade Portuguesa* (Portuguese Youth) brought new spatial requirements to *liceus*. As a paramilitary organisation, inspired by Italian fascist and Nazi Hitler youth, it was compulsory for children aged 7 to 14, and was headquartered in *liceus*.

In general, *Estado Novo liceus* buildings followed a regular and symmetrical layout, marked by rhythmical facades defined by structural elements (with the use of a reinforced concrete-crosslinked structures, i.e., pillar-beam systems), and the repetition of standard windows, topped with a pitched roof. The gymnasium is now also the ballroom, with a stage, not just for students meetings but also for political gatherings. Furthermore, the introduction of cinema in 1936, films being considered an educational material, was stressed in the 1937 conference on 'School Cinema and its use in *liceal* students education' (Gomes, 2003). The gymnasium is therefore a multi-purpose space, located in an axial volume opposite to the main entrance volume, which holds the library on the upper floor, clearly visible from the public realm. Under the 1938 Plan, 13 *liceus* were designed and built throughout the country, and the last to be built was inaugurated in 1952 (Marques, 2003). From these, four have been rehabilitated under SMP, from which the following cases were chosen:

Case Study 5 (5CM): Liceu Carolina Michaelis, Oporto: 1943-1951



Figure 6.5. 5CM: main facade (*circa* 1951). Source: PE/BAME at <http://www.eduarquivo.sg.min-edu.pt/>, accessed 27-08-2011.

Case Study 6 (6DM): Liceu da Infanta D. Maria I, Coimbra: (1938) 1943-1948

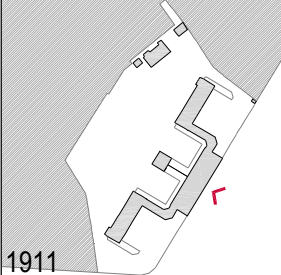
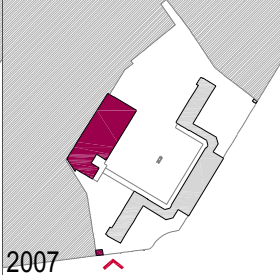
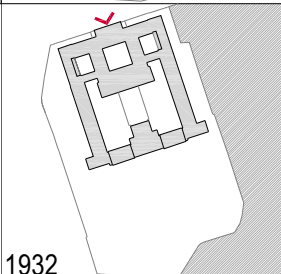
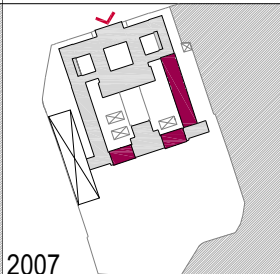
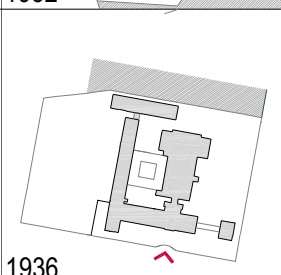
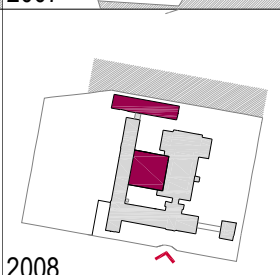
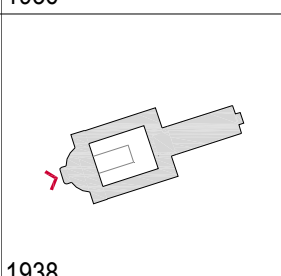
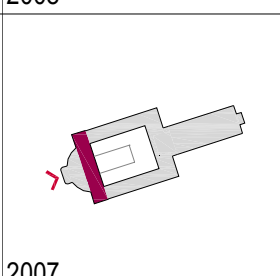
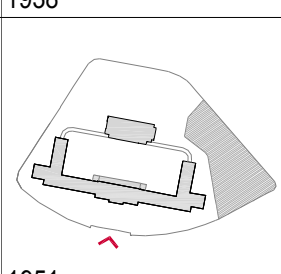
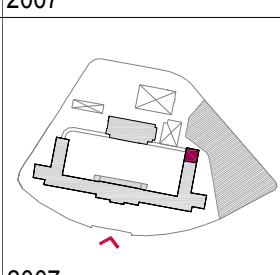
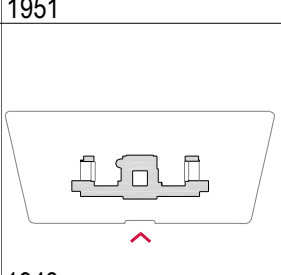
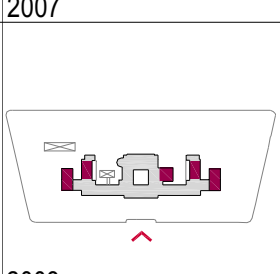


Figure 6.6. 6DM main facade at inauguration (*circa* 1948). Source: PE/BAME at <http://www.eduarquivo.sg.min-edu.pt/>, accessed 28-08-2011.

Briefly, *liceus* buildings from this period are historically significant because there are only 13 examples of *Estado Novo liceus*, which have an historicist and monumental character, expressing the power of the state and spreading the values of authority and order (Teotónio Pereira, 1987). Re-designed by state architects, this style would only prevail for a decade in *liceus* buildings, for which they are important in illustrating the first approach to a standard architectural expression, while reflecting the developments of *liceal* education within a dictatorship regime, with the separation of genders, para-military influence in educational activities and segregation of students from lower income families who would attend technical education. In the 1st National Architecture Congress, in 1948, opposing voices to the establishment of a unique architectural aesthetic expression were heard. This established a shift in the *Estado Novo* architecture with the aim of embracing contemporary ideas, following an essay by Fernando Távora on 'The problem of the Portuguese house' (Távora, 1947) and changing this standardised aesthetic and architectural production.

6.3. Design Values

The purpose of this section is to establish the material cultural values of historic *liceus*, i.e., the physically observable cultural heritage value of a place (ICOMOS New Zealand, 2010, p. 10), which are embedded in their historic design values, considering the sequence of construction and evolution change, and contribute to the distinctive character and identity of these places in the assessed period of significance, i.e., before rehabilitation interventions. As it has been suggested that, due to the development of places, it is rare to find historic or period unity in a place (Orbaşlı, 2008, p. 197), the assessment of material cultural values focused on the analysis of three periods of significance: in the original designed elements, in its physical development over time, and in its physical condition around 2007. The study of these periods contributes to the assessment of the degree of authenticity and integrity of historic *liceus* in place at that time. Therefore, and considering that 'heritage sites and objects must be understood in relation to their contexts - in other words, holistically' (Mason, 2002, p. 14), the tangible values of the historic *liceu* setting, the building and its contents were assessed and patterns were found in a multi-layered context of attributes which, together, contribute to the design significance of *liceus*, through the distinctive physical attributes that make these buildings a specific architectural typology.

1PN		
2RF		
3DG		
4FL		
5CM		
6DM		

■ ADDITIONS
 ☒ TEMPORARY PAVILIONS



Table 6.2. Case studies timeline: schematic diagrams at inauguration date and survey date.

6.3.1. Design Values of Setting

As setting provides 'evidence of a particular civilization, a significant development or a historic event'(ICOMOS, 1964), this section acknowledges the contribution of the setting of historic *liceus* to their identity and distinctive character. The heritage significance of historic *liceus*' settings is defined by understanding the history, evolution and character of the surrounding areas of the architectural heritage, the townscape and the landscape, as its local spatial context, informed by its authenticity and integrity conditions at the assessment date. The discussion, namely supported by comparative analysis of schematic diagrams, which summarise the physical developments of case study sites between their inauguration date and survey date (see Table 6.2), briefly provides an understanding of the historic evolution and current character of historic *liceus*.

Townscape

Considering townscape, or urban character, value to be found in all elements of the original design, the historic evolution and morphology of the attributes of the place (Orbaşlı, 2008, p. 197) establishes a relationship between the urban context and the buildings' site through the contextual analysis of three of its attributes: site's urban context, site visual catchment and site accessibility. These elements will shed some light on the contribution of design to the character and identity of historic *liceus*.

Within the urban context, historic *liceus* were originally situated in district capitals, in large, irregular-sized plots. Although the first *liceu* (OPM) was sited in the historic centre of Lisbon, the following *liceus* buildings were located in development areas of the main cities of Lisbon (1PN, 4FL), Oporto (2RF) and Beja (3DG). As previously explained, in the dictatorship period, *liceus* were required to have a master plan for the area. In Coimbra, the plan considered the public initiative of building education facilities and a sports stadium as anchors for further housing development. As 6DM was one of the first buildings of the built, the site was then known by the school community as 'the Sahara desert' (6DM-SD, 2011), as there was not even public transportation to take the girl students to the *liceu*. This fact stresses how important *liceus* were for the development of new urban areas in the *Estado Novo* period and how visionary they were as, in 2007, this area is a consolidated urban zone.

In most cases, topography was used to stress the distinctive character of the buildings (1PN, 3DG, 5CM, 6DM). For example, 5CM was located opposite 2RF in the Oporto central area, stressing *Estado Novo*'s preference for places in a higher location to emphasise the

monumental character of the *liceu* buildings. This perception was emphasised by the urban design, as the ascension through the central public stairway would evoke a feeling of uniqueness, of selection, which in fact was taking place with the segregation of students from lower income classes, as previously explained.

In 2007, the urban developments did not affect the original views and landscape developments within the plots, preserving the important view of the main facade. No obstacles were built in front of the building and, generally, the *liceus'* facades preserved their character. However, the public image of the schools was denigrated by the physical conditions of the setting. Inadequate use of outdoor spaces and a general lack of maintenance was found in the *liceus'* entrances, such as broken lamps, tags painted in fences, graffiti on the walls and dirty spaces. The main facades show signs of neglect with broken windows and paint peeling off, although aluminium frames had replaced the original steel or wooden ones (see Figure 6.7). In 1PN and 3DG, plastic blinds for the provision of solar shade had been added to the windows, detracting from the original aesthetic design.



Figure 6.7. 5CM: main gate (2007). Source: PE.

Landscape

The landscape design values, i.e., the action of human factors which establishes the character of an area (Council of Europe, 2000) were established through the comparison of the attributes of the original design of the historic *liceu* building surrounding areas, or outdoor areas within the plot, and the physical developments of these sites (see Table 6.2). The proportion of educational space outdoors stresses the importance of assessing the values of

the outdoor areas of historic *liceus* in the three following attributes: building siting, approach from the public street to the building, and functional and spatial layout of outdoor areas.

The values of the original design of historic *liceus* outdoor areas can be found in such buildings' siting, as previously mentioned with regard to townscape value, but also regarding views from within the plot. The *liceu* classrooms were generally positioned away from street noise and pollution, and providing the building with suitable exposure to the sun. The provision of suitable daylight, maximising exposure but avoiding glare, was achieved by elongating the classroom wings along the east-west axis (1PN, 2RF, 3DG), gradually changing (4FI, 5CM, 6DM) to the north and south directions. Siting is therefore a value, using plot characteristics to better locate the building in order to provide comfortable use of the interior spaces.

The entrance approach to a public building is an important element to the establishment of a *liceu's* character and identity. Generally, *liceus* have one main entrance, symmetrically located on the main facade. Eclectic buildings have two further doors, one on each side of the main entrance, which were originally used by different age groups, as then required by legislation. In this period, *liceus* buildings were situated on the street level with a direct entrance, and the symbolic 'elevation of the minds' of students, as to raise the spirit to a higher knowledge, happened in the interior, in a grand atrium with a monumental staircase. Modernist *liceus* have a small number of steps at the main door, with 3DG gaining a small distance from the street. As an asymmetrical building, it does not have the main door in a central position, justified by the functionalist approach taken to a Modernist idea of 'form follows function' where educational uses were organised in individual volumes, expressed in the building's exterior mass. Finally, in the *Estado Novo liceus*, the building is distant and higher in relation to the street, stressing the importance of 'looking up' at the building before entering. The facade displays an entrance porch in which the entrance door is set back and slightly elevated. The entrance had already been preceded by ascending steps, after passing through the main iron gate at street level, stressing to the public realm the symbolic idea of 'elevation of minds' and of the inaccessibility of many people to knowledge. Therefore, the entrance has a symbolic design value.

The outdoor spaces gained new significance during the Dictatorship, as previously mentioned, since paramilitary parades were organised in *liceus*, playing an important role in the disclosure of a nationalist ideal. That fact drew attention to the design of exterior spaces (5CM, 6DM) (see Figure 6.8).

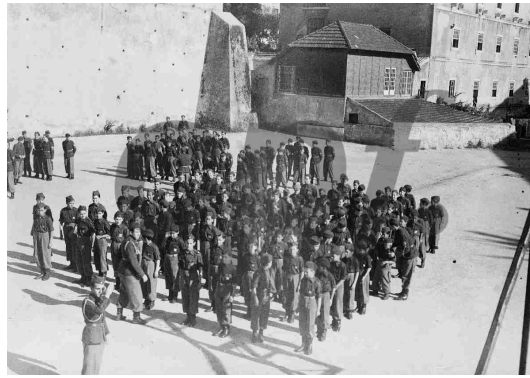


Figure 6.8. OPM: *Mocidade Portuguesa* para-military parade (1938). Source: ANTT, ref. PT/TT/EPJS/SF/001-001/0055/1629M, at <http://digitarq.arquivos.pt/>, accessed 11-10-2013

Outdoor areas were no longer considered the 'leftover' areas of the construction of the *liceu* buildings (Parque Escolar, 2009a). Shaded areas were provided outdoors, either around courtyards (OPM, 1PN), between courtyards (2RF), or in the ground floor of the buildings (5CM, 6DM). Other social spaces were gardens (OPM, 3DG, 5CM, 6DM), with trees, flowers and bushes, and the sports pitches or the 'esplanade' – the wide area for the paramilitary parades. Case 4FL is paradigmatic. As the building is the central facility of an urban housing development, and the building is, in itself, the 'quarter/block', no exterior grounds were available outside the building, and a Modernist idea was designed: the sports pitches were located on the roof top.

Morphological drawings assisted in the identification of the sites' design values in 2007. The following plans (see Figures 6.9) map the attributes of the *liceus'* physical setting, as found in 2007. These plans are followed by the design of Table 6.3, which summarises the main characteristics of *liceu* setting values in 2007 (the colour scheme used in the plans was used in this table).

The analysis of the case studies timeline (see Table 6.2) had indicated that since its original construction until 2007, the outdoor area of the *liceus* was mostly preserved. Additional classroom area was acquired by extending the existing buildings or by adding temporary pavilions. These 1980s pavilions (2RF, 5CM and 6DM) were located in different places in courtyards or at the back of the main buildings. The prevalence of temporary pavilions on site in 2007 detracted from the quality of the built environment and did not offer a pleasant outdoor view nor a comfortable interior environment.

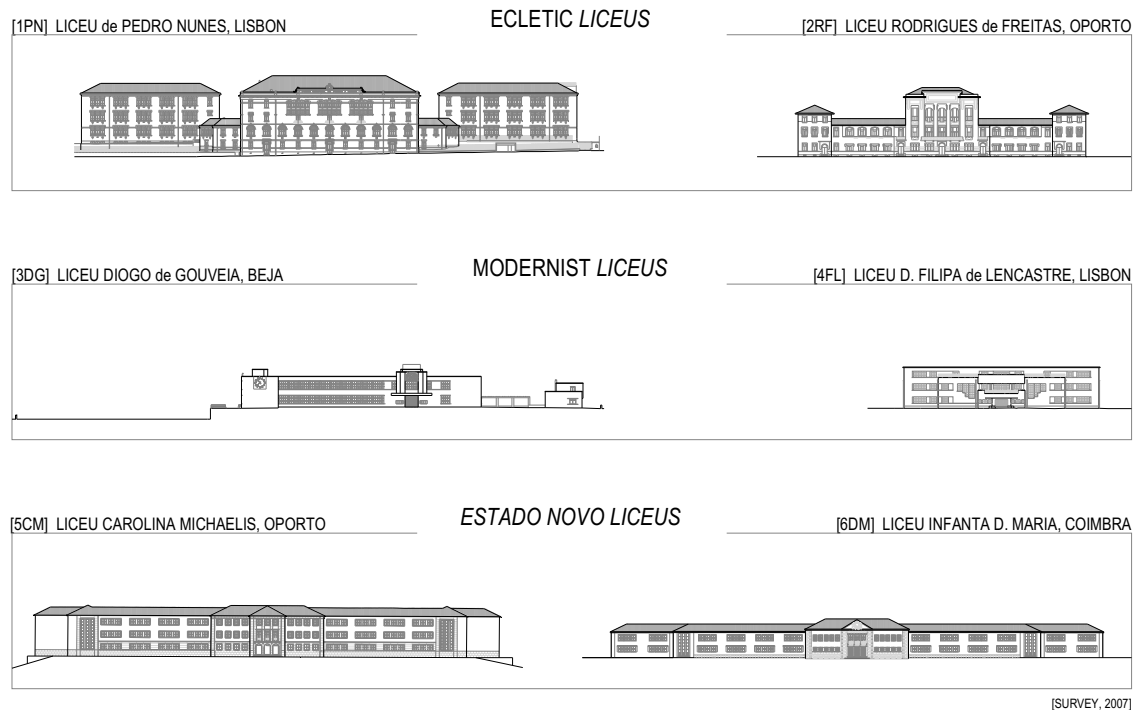


Figure 6.9. Case Studies Metric Survey: *liceus'* main facades (2007).

All *liceus* preserved their main facade (see Figure 6.10), which faces the public realm, except for 4FL which was extended with the addition of an extra level. Entrances were kept through the original main door, except in 1PN where, to protect the views from fights among students and outsiders, and preserve the image of the school (1PN-SD, 2011), the students' entrance was moved to the rear lateral street gate. In fact, this option preserved the image of the school as a calm and secure environment, but it prevented students from experiencing the monumental staircase when entering the building – an experience believed to be important in establishing a link with the historic environment of *liceus*. However, the image of the school seems to have not been an issue regarding car parking. Most *liceus'* outdoor areas were found to be occupied by cars, including in front of the buildings (see Figure 6.11), even on top of previous gardens (OPM), affecting the entrance and creating a negative image from the public view.

[1PN] LICEU de PEDRO NUNES, LISBON



ECLETIC LICEUS

[2RF] LICEU RODRIGUES de FREITAS, OPORTO

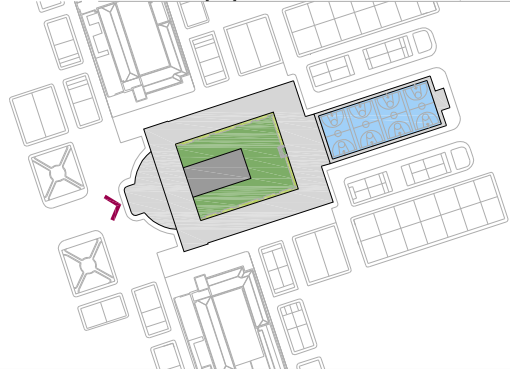


[3DG] LICEU DIOGO de GOUVEIA, BEJA



MODERNIST LICEUS

[4FL] LICEU D. FILIPA de LENCASTRE, LISBON

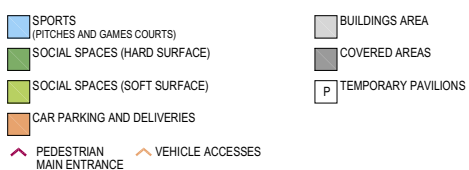
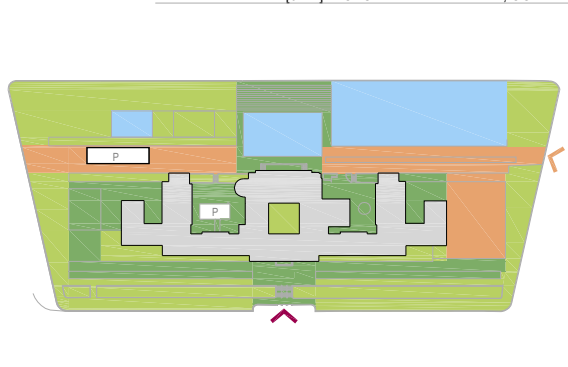


[5CM] LICEU CAROLINA MICHAELIS, OPORTO



ESTADO NOVO LICEUS

[6DM] LICEU INFANTA D. MARIA, COIMBRA



LICEUS [CASE STUDIES]

SITES: BUILDINGS AND GROUNDS
[SURVEY, 2007]

GENERAL SITE PLANS

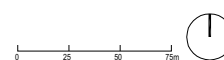


Figure 6.10. Case Studies Site plans, per period (2007).



Building types	Eclectic <i>liceus</i>		Modernist <i>liceus</i>		<i>Estado Novo</i> <i>liceus</i>		
Case-studies setting	1PN	2RF	3DG	4FL	5CM	6DM	
Plot	shape	irregular (originally located in urban planning stage)	irregular (originally located in urban planning stage)	regular (originally located in urban planning stage)	semi-regular, located in historic fabric	regular (originally beacon of urban planning stage)	
	size	18.910 m ²	28.115 m ²	23.460 m ²	6.940 m ²	18.850 m ²	27.650 m ²
	boundaries	walled/fenced; inside a city block	walled/fenced; inside a city block	walled/fenced; major part of city block	building itself; occupies one city block	walled/fenced; occupies almost one city block	walled/fenced; occupies one city block
outdoor spaces and courtyards (n.o/type)	large; 1 open (originally two smaller)	large; 2 small closed; 2 big and connected	large; 1 small (1 originally open - meanwhile closed)	small 1 big enclosed	large; 1 big open	large 1 smaller closed; 2 small open	
Site entrance  pedestrians  cars	through secondary lateral door (originally through building, axial)	through building, axial (original)	through main gate, not axial (original)	through building, axial (original)	through main gate and staircase, axial (original)	through main gate and staircase, axial (original)	
Buildings (footprint, location) (p) temporary pavilions	4.340 m ² (23% of the plot) along a public street; autonomous gymnasium added on the back	6.120 m ² (22% of the plot) along a public street (originally just planned); temporary pavilions added	5.950 m ² (25% of the plot) inside the plot, asymmetrical location regarding main street	4.855 m ² (70% of the plot) centred on the plot, surrounded by public streets	3.350 m ² (18% of the plot) centered on the plot; 5 autonomous temporary pavilions in the back yard	4.090 m ² (15% of the plot) centered on the plot; 2 autonomous temporary pavilions in the back yard	
Shaded spaces	peripheral to central courtyard	between courtyards	none (originally peripheral to central courtyard, has meanwhile been closed)	central, in courtyard	none (originally spaces on building ground floor have been meanwhile closed)	none (originally spaces on building ground floor, have been meanwhile closed)	
Social spaces (hard surface)	courtyard	Big courtyards, buildings rear platform	Frontage and inner platforms	courtyard	Courtyards; designed pathways	Courtyards; designed pathways	
Social spaces (soft surface)	Green at front on all sides (previously botanical garden)	Green in small courtyards; informal areas in sports zone (back)	Inner small gardens; informal areas in sports zone (lateral)	Small green areas	Front and courtyard gardens; informal areas in sports zone (back)	Front gardens; informal areas in sports zone (back)	
Sports areas	pitches and games courts (city use of football pitch)	pitches and games courts (informal football pitch)	informal pitches and games courts (city use of football pitch)	informal/ pitches and games courts	pitches and games courts (political regime parades)	pitches and games courts (political regime parades)	
Accessibility users	Direct entrance from street	Direct entrance from street	Exterior space between street gate and entrance door	Direct entrance from street	Exterior staircase links street gate to entrance door	Exterior staircase links street gate to entrance door	
Cars (parking, deliveries)	Originally not considered; unorganised parking; use of existing separated entrances	Originally not considered; unorganised parking; use of existing separated entrances	Originally not considered; unorganised parking; use of existing separated entrances	(no exterior areas)	Originally not considered; parking is organized; use of existing separated entrances	Originally not considered; parking is organized; use of existing separated entrances	

Table 6.3. Case studies: attributes of *liceus* settings (2007).



Figure 6.11. 3DG: informal parking and aluminium frames (2007). Source: PE.

The functions established for outdoor areas and the physical condition of these spaces do not share the distinctive character of the *liceu* building, which has been preserved. Informal pitches, stepped on gardens and broken benches and steps offer an image of negligence. The landscape design of these areas was given equal design relevance in Modernist and *Estado Novo liceus* building designs, demonstrating the acknowledgement of the potential of this space for promoting a sense of ownership of space by students and staff, thereby encouraging people to take care and respect their outdoor areas. The research found that the original site design of 3DG, 5CM and 6DM was preserved. The natural environment played an important role, as for example the historic tree in OPM, the botanical name of which means 'beautiful shadow'. Its age, natural beauty and aesthetic importance characterise it as a 'natural monument' within an education historic environment. However, no such protection was ever given to the remaining tree, which was observed to still perform a social role.

The research found changes in the urban landscapes but no evidence of intrusion on views and vistas for and from the historic *liceu*, or changes to the skylines, which contribute to identifying 'the character of the arrival experience and the heritage resource itself' (ICOMOS, 2005, p. 2). The reason relies on the planned construction found in all periods, with the *liceus* being built before the neighbourhood, particularly in the *Estado Novo* period, enabling the *liceu* to preserve its authentic contribution to the significance of the urban area. Neighbourhoods have been built and *liceus* are now part of the cities' urban fabric, well served by public transportation, which contributes to its urban value. Therefore, there is an implicit urban planning value in historic *liceus*, contributing to the townscape value.

Cumulative impacts of transformation on the settings was mapped in each *liceu*. Education changes required more interior spaces for which the landscape was changed with the introduction of new volumes and some additions to the historic buildings. Temporary pavilions

were also added in outdoor spaces behind the *liceu* building, which were therefore not visible from the public realm.



Figure 6.12. 6DM: temporary pavilion (2007). Source: Arch3

A constant pattern was found on the facades, preserving the design of the original elements, with a symmetrical layout, axial entrances and emphasis of the entrance – all requirements of a public building. The developments over time are expressed in the change of the window frames in some *liceus*. Different approaches were taken for the location of the *liceu*'s name, which was found to have been changed since the original construction due to political changes, expressing the importance of a name in a public educational facility.

The setting significance of historic *liceus* relies therefore on their townscape and landscape values, which gives an important role to these urban landmarks. Seen as 'beacons of learning' (Clark and Seabourne, 1995), they exalt a distinctive character, which contributes strongly to the identity of an area, providing a range of insightful views, with reference to the view towards the main facade from the public street as a key significant viewpoint. However, for those experiencing the site and the urban landscape, the physical condition of the *liceus* landscape and of the historic building displayed a lack of care and maintenance, namely through the lack of care given to buildings, pavements and natural elements, such as plants and trees. The message being sent is of economic difficulties, social disregard and cultural neglect. These messages collide with the overall aimed message of education as a valued social and cultural activity. Therefore, neglect is interpreted as affecting symbolic and intangible values of historic *liceus*.

6.3.2. Design Values of the Historic *liceu* Building

The characterisation of historic architecture is based on the identification of features that relate buildings to established historical typologies or styles – a method typically used by architectural historians and architects (Sanoff, 1991). However, to focus on meaning, design guidelines have suggested the identification and documentation of buildings' physical characteristics that convey uniqueness of a place (Low and Ryan, 1985). Therefore, instead of looking for conceptual and formal languages of the architectural style already approached in the previous sections and in heritage listing records, in this section key elements of the physical environment of *liceu* buildings were studied in drawings and photographs. This was to establish the value of design in expressing a pedagogical model in a *liceu* building at the time of its origin, during its development and in terms of what such buildings were offering to secondary education in 2007.

The value of the architectural design of historic *liceu* buildings was established by considering tangible attributes as physical records of the original time, place and use. Patterns were found in the original design at the three original periods of construction created in the first half of the twentieth-century, using the 4Fs approach: Form, Function, Fabric and Furniture, Fixtures & Contents (see Chapter 2). These material components of an historic school building will be discussed, separating FF&C which is addressed in the next section as it embraces the fixed and loose heritage of historic *liceus*. In a close observation of the development of *liceus* sites, the physical condition, authenticity and integrity of these attributes in 2007 is discussed.

Form

Analysis of the form of historic *liceus* is supported on the ability of elements of scale and composition to provide spaces of liceal education. *Liceus* are characterised by a considerable overall scale, with a significant volume of construction enclosing two to three levels, where common teaching spaces and classrooms were arranged in rows on single-sided corridors. The most valued functions were located in the main facade volume, so they could be clearly visible from the public realm. Eclectic *liceus* are single central buildings, defined by their closed courtyards (OPM, 2RF), which opened to an articulation of volumes that took a linear-pavilion type shape, establishing open courtyards (1PN). In all, the topography contributed to the partial use of one extra level of rooms at the foundation level. Their high ceilings enabled higher facades and larger windows, guaranteeing better indoor air quality, for which 1PN has here the gymnasium, highlighting the importance given to physical education, while in 2RF the long vertical windows on the upper floors shone natural light into the museum and library.

Both were located on top of the main atrium, highly visible from the public street. Modernist *liceus* also expressed their contemporary aesthetic and technical period in the design of their facade. In an experimental period for construction systems and materials, such facades saw the introduction of flat roofs, wide horizontal windows in round shapes and asymmetrical volume compositions. In 3DG, the wide windows facing north shed natural light into drawing classrooms and the use of glass circular pieces on the gymnasium flat roof introduced a special light atmosphere in this space. In 4FL, thin and elegant steel frames in large longitudinal windows, as opposed to thick wooden frames, made openings more transparent, and brought more light to the interior spaces. *Estado Novo liceus* observed a return to symmetrical plans, in a linear layout, with a long longitudinal main facade parallel to the street, enabling a wider public view, with less opening areas, and topped with pitched roofs with overhanging eaves. A recessed entrance, a plinth at the base of the wall, mouldings, outward projecting cornices, pilasters and entablatures composed the new aesthetic expression. The standardisation of *Estado Novo* architectural elements, and of nationalist decorative elements in wrought iron, meant that the *liceus* built in this period have an easily recognisable image, therefore fulfilling the regime objectives.

The planned layout of *liceu* buildings from the first half of the twentieth century had a symmetrical composition, defined by a strong central axis, perpendicular to the main facade, and secondary axes, parallel to the street, forming courtyards. An exception can be observed in the buildings from the Modernist period where, although courtyards were formed, in 3DG a functional plan was expressed by the definition of two axes perpendicular to the main facade, which connected with the perpendicular axis in a geometrical and asymmetrical composition. The place where the main axes, perpendicular to the facade and parallel to the face, meet defined the main entrance and the atrium. The location of the main staircases would change from a central position, in Eclectic *liceus*, to a lateral location in the Modernist period, to a symmetrical location of two staircases, away from the atrium. The first *Liceus* had several interior patios with a shape very similar to the convent cloisters that inspired the French *lycée* model and the first purpose-built *liceu* (OPM). This model is a consequence of hygienist concerns and of surveillance concepts. The shape of 4FL building is also dissonant from the other *liceus*: there is no private plot and only a small front facade finishing a longitudinal building with one courtyard, with the rooftop used to provide sports facilities.

The analysis of *liceu* buildings' form in 2007 found that the evolution of the buildings due to the rapid increase in enrolment in secondary education after the Portuguese Democratic Revolution in 1974 was catered for through extending the historic buildings or/and by building

temporary pavilions, as previously mentioned. Generally revealing the preservation of the authenticity and integrity of the original form, the observed physical change of historic *liceus* used the same architectural language and design strategies of the original design. For example, the reported addition of a level for classrooms and toilet facilities in 2RF, described in the '*Liceu* Report 1957/1958' (in Correia, 2003b, p. 674), was not visually identifiable. Pastiche was the technique used. Curiously, no additions were made to OPM, the oldest *liceu*, which seems to indicate that the building might have been large enough and flexible enough to accommodate a variable number of enrolments and diverse changes in the education curriculum in its 100 years of continuous existence and use.

The only case where some original buildings were demolished within the *liceu* site was 1PN. First, the outdoor toilet facilities in the inner courtyards were removed, as well as the lodgings of the rector, the chief of staff and the guards, which originally existed on the northeast side of the plot, and finally the canteen, originally located in the central position of the courtyard, which defined two recreation areas (two patios). The canteen function was integrated into the new 1964/5 gymnasium building (see Figure 6.13) with a contrasting design (namely using nationalist colours – a green facade and a red interior) described as an 'architectural thread, well characterised by the era conception, which was 'unifying all the schoolyard space' (Gomes, 2003, p. 542).



Figure 6.13. 1PN: The new gymnasium and canteen building (1964/5). Source:Arch1.

The names of certain *liceus* have changed since their original construction. In 2RF, the original building name was designed on the facade but was later changed to *Liceu D. Manuel*. The return to the original name in 1974 was not yet updated on the main facade in 2007 (see Figure 6.14). In 3DG, the founding name (1915) was on the facade in its inauguration period and it was changed to the current name (see Figure 6.15). Two moments of change in *liceus'* names were found in 1919 and in 1936. While in the first *liceus* were to be named after significant intellectual individuals whose memories recalled civic and moral virtues, in later

projects the names of major figures of national history were selected in an attempt to eradicate any residual republican values and creating a 'new political order' (Figueira, 2003). This fact, and the fact that after the 1974 Democratic Revolution several *liceus* recovered their republican references (e.g. 2RF), indicates that names are an element of identity of these spaces with strong political value. In fact, the history of education and twentieth-century education policy can be written through the names of *liceus*.

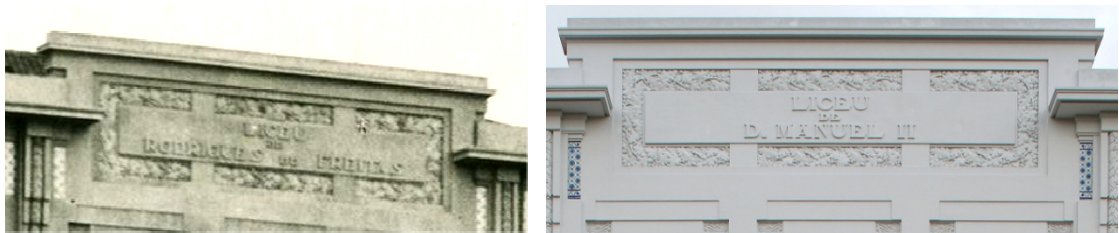


Figure 6.14A and B. 2RF: name on the facade (*circa* inauguration and 2007). Source: PE.



Figure 6.15A and B. 3DG: name on the facade (*circa* inauguration and 2007). Source: PE.

Therefore, the original style was preserved and any changes to the original form, scale and composition of *liceu* buildings followed the strategy of articulation of additional volumes, preserving the ordering principles of the historic *liceus*, namely using design strategies applied in the original design based on symmetry, proportion, hierarchy, rhythm and repetition (Ching, 2010).

Functional-Spatial Layout

The design value of historic buildings is directly related to the space organisation principles used in the relationship between the education functional programme and the building's form. The spaces required for liceal education in historic *liceus* were initially established in the 1905 Reform, which replaced the 'subject regime' by the 'class regime', i.e., groups of students were set out to be taught different subjects. This new philosophy stressed the classroom as the core

unit of *liceus* buildings' spaces (Alegre, 2012a). Hygienic principles followed the Latin motto of *Mens sana in corpore sano* (a healthy mind in a healthy body), which guided the overall design of *liceus* for the provision of air renovation and daylight. The compulsory practice of gymnastics and physical exercise (Providência, 2001) introduced the gymnasium. The relevance now given to inductive and experimental teaching practices in the natural sciences added laboratory spaces for physics and chemistry. The nineteenth-century Grand Tour (also important for architects, as the case of the Robson who published as a result in 1874 'School architecture', as referred in Dudek, 2000) added importance to geography (which used historical and geographical wall maps), while modern languages used didactic materials imported from Europe. Artistic subjects necessitated large design classrooms. Finally, museums were set out to gather teaching materials and collections (Nóvoa and Santa-Clara, 2003). The number, defined by the amount of classes and the type and location of rooms set up a hierarchy of spaces where the social position of users within the buildings establishes a clear threshold: student spaces were the corridors and the outdoors while teachers' spaces were the teaching rooms. It is therefore important to understand the circulation within the buildings.

Eclectic *liceus* plans show the group of classrooms around, or along, a circulation corridor, which departs from the main entrance atrium and its monumental staircase. In the case 1PN, the classroom size is 8.00 x 7.00m, with a ceiling height of 4.32m (Gomes, 2003, p. 557) (see Figure 6.16). High ceilings reflect the hygiene concerns of the time for clear air and ventilation. Classrooms are organised along a corridor with the windows facing a courtyard. Also noticeable are the size of the windows and the predominance of facing east or west. In addition, 1PN and 2RF have windows at opposite sides of the classrooms, enabling cross-ventilation. Safety precautions ruled the location of laboratories for chemistry and physics, detached from the *liceu* building or at the extreme ends of wings, which hold corridors and rows of classrooms. Administration, library and physical education functions were located in a central position in the main axis of the building. Note that 2RF had a swimming pool, which was used until 1956 (Fernandes de Sá, 2011, p. 18).



Figure 6.16. 1PN: a regular classroom (circa 1950s). Source: Novais Archive/FCG ref. CFT003 056531.ic, at <https://www.flickr.com>, accessed 18-12-2013.

Modernist *liceus'* functional layout was similar, as no further legislation set out any other physical requirements, although in some cases they did not follow a symmetrical plan (e.g. 3DG). Generally, the administration spaces were kept near the main entrance, as was the library and teachers' room, as well as the gymnasium and, in the case of 3DG, the swimming pool (although never finished, it would later be adapted for a gymnasium). In 4FL, the building under construction for a primary school for both genders was adapted for a girls *liceu*, for which special spaces were designed, such as rooms for crafts, needlework and choral singing.

Estado Novo liceus reflected the design guidelines issued in 1941 by JCETS, previously referred to, which identified functional groups of spaces, including guidance on dimensions, materials, accessibility, light, solar exposition and accessibility issues (Alegre, 2012a). The list grouped spaces in: administration, school services, special services, physical education, communication services and other spaces (Marques, 2003, p. 75), further establishing that corridors should be 2.50m wide (in JCETS-MOPC, 1941, p. 72, cited in Alegre, 2012a, p. 256). These *liceus* further included spaces for *Mocidade Portuguesa's* headquarters and activities, such as a cinema (introduced in 1936, usually using the assemble hall/gymnasium) and a canteen.

When analysing circulation areas, beside the outdoor approach to the building and the main entrance, the interior corridors in their horizontal configuration and the vertical access points show that there were a hierarchy in the users' movement within the buildings. Distribution atriums' vertical access points, such as the main and secondary staircases, organised the functional groups of the *liceu*. Due to the daily use of these spaces, and particularly the corridors where students establish their social relationships, they are important in the memories of users and have a role in establishing attachment to a place.

In 2007, the spaces required for secondary education were not much different in function, preserving the need for administrative spaces, spaces for teaching, gymnasium, a library, social and supporting areas. ICT had already been introduced in most schools (even in *Liceu de Oeiras*, providing better equipment than what was later implemented by SMP). However, the legal requirements regarding dimensions had changed, particularly the areas of the sports, canteen, library, among other educational spaces. Functionally, existing laboratories limit the conduction of experiments due to safety and security measures required.

This reaction to education changes, such as those observed in the 1960s, which required more spaces for more students, has been further reported in 6DM, where spaces beneath stairs and corridors were used to give classes, and a system of shifts enabled to teach students at night (Seabra, 2003, p. 207). Later, another adaptation took place in all *liceus* with the reestablishment of mixed classes in public education, to be in place in 1973. Organisational problems, namely regarding the required new spaces of toilet facilities and playgrounds, were resolved within the buildings. Nevertheless, even with changes in the functional-spatial layout, such as the additions at the foundation level and changes of functions in 3DG, some specific elements of *liceus* preserved their authenticity and integrity, such as the large corridors (see Figure 6.17), gymnasiums, libraries and some laboratories.



Figure 6.17. 3DG: corridors (2007). Source: PE.

However, several problems can be highlighted in the functional-spatial layout of *liceus* in 2007, which can detract from their use value. For example, contemporary standards on internal accessibility were a problem in 2007 as inclusiveness in all public buildings was prescribed by Law, and none of the *liceus* had a lift. The dimensions of the in-door spaces for physical education limited group games, which are now more in use than gymnastics. Canteens, which became essential when a system of the 'whole-day school' was suggested, became small for the amount of students, and staff did not have the space needed. Laboratories are not prepared for currently advised teaching, and experiments are limited by the lack of

preparation rooms. These are just some examples of problems found crossing the analysis of 2007 functional-spatial layout of historic *liceus* and the secondary education curriculum currently in force.

In summary, the functional-spatial layout provided an authentic use of historic buildings by preserving the most significant places in use and in the same location: classrooms, gymnasiums, laboratories, libraries and administration. The use value of historic *liceus* was found in the flexibility and improvisation used in their lifetime, which enabled its continuous use, and suitability for contemporary education. In decades of use, minimal changes were found to the functional-spatial layout and, considering the observed lack of maintenance, many in a considerably acceptable physical condition. Crossed with the fact that only 2RF has seen its student numbers decline in recent years, this research found that although the physical conditions may not have been adequate for secondary education, the buildings still offered a reliable heritage place for education, with its significance embedded in the functions and types of used being provided.

Fabric

Fabric analysis is focused on the following physical material attributes of historic *liceus*: materials, colour, construction systems/structures and services, including buildings interiors and sub-surface materials. The assessment aims to highlight the cultural significance embodied in these physical materials (ICOMOS Australia, 2013, p. 2) as it is perceived that 'traditional' materials make a strong contribution to local distinctiveness, as does the sensitive use of appropriate colour, texture and pattern of materials. The capacity of the building to provide a safe and secure place can be evaluated through the analysis of the construction system (e.g. regarding seismic activities) and materials (fire-proofing). Analysis of materials can also indicate the acoustics and thermal conditions of interior environments, which are recognised as having an impact on academic achievement, and therefore in the use value of *liceus*. Although one of the most important attributes in the twenty-first century considers the energy efficiency of *liceus* buildings, which can have a major impact on managing decisions regarding costs such as taxes, this research will not study that attribute. However, the embodied energy of the buildings is now recognised as an environmental value. As the case studies are buildings from the twentieth-century, 'materials and construction techniques may often differ from traditional materials and methods of the past due to the use of new or experimental materials

and construction methods' (ICOMOS ISC20C, 2014, p. 6), for which the analysis will address specific experimental procedures in the design and development of historic *liceus* buildings.

Turning now to the design value of original fabric, materials and construction systems are discussed. Research on construction history can provide insights on designed building components, load-bearing structures, and established building materials. Deterioration and specific pathologies may provide relevant information for design decisions, as in the case of OPM where the structural analysis of the building diagnosed that the foundations required structural reinforcement, and the excavation required to do so offered an appropriate place to locate the new canteen. A constraint was interpreted as an opportunity. The construction standards at the original time of construction were quite different, as today anti-seismic regulations, thermal environmental comfort, energy efficiency, recycling, and, particularly in the case of schools, air quality and ventilation have strict standards. As an example of historic research on *liceus* fabric, the case of *Estado Novo liceus* is discussed.

The journal *A Arquitectura Portuguesa* (The Portuguese Architecture), in 1944, dedicated a whole volume to the works conducted by the *JCETS-MOP*, selecting six cases included in the 1943 *JCETS* Report. As they were constructed during the Second World War, the article is mainly focused on showing the construction stages of the *liceus* designed or intervened in according to the 1938 Plan, while justifying the difficulties in meeting the construction deadlines by the 'indisputable current difficulties' (Santos, 1944, p. 16) in obtaining materials, in transportation, in manpower for construction works and with the inherent rise in salaries. The journal then acted as a tool for the dissemination of the Portuguese architecture that *Estado Novo* wished to spread: a nationalist architecture which evoked the glories of the nation by the use of characteristic decorative elements such as the armillary sphere, representing Portuguese navigation and overseas colonies, which is also included on the national flag, as well as the use of noble materials on the facades such as stone and iron, among others.

Thin iron window casements applied in the Modernist buildings stressed the new materials available, and the possibility of having wide windows. In *Estado Novo*, wooden frames were used in a standardised design for all *liceus*. Structures are hidden behind plaster, coatings or panels made of materials with different properties. Finishing materials in floors, walls and ceilings reflected the availability of materials, and colour was used as an identity element in *Estado Novo* buildings in general: the *Estado Novo* pale yellow. The original integrated building systems (light - electrical, hygienic - ventilation and toilets) complied with indoor

environmental quality standards at the original time of construction while expressing the aesthetic of the time, such as the lamps in 2RF's library or the lamps in 3GD's drawing rooms.

In 2007, study of the condition and deterioration of constructive systems, materials and building systems showed that historic buildings were not capable of providing the contemporary 'standardised building codes (e.g. accessibility requirements, health and safety code requirements, fire-safety requirements, seismic retrofitting, and measures to improve energy efficiency)' (ICOMOS ISC20C, 2014, p. 6) for schools. Original building system components – pipes, wiring, heating – had become unfit for repair or maintenance, finishing materials were showing tear and wear, and missing elements had not been replaced, etc. For example, in Modernist *liceus*, the physical conditions were problematic, particularly regarding water infiltration, indicating problems with the flat roofs. The buckets in 4FL's corridors demonstrated the problem. In general, when asked to describe the buildings before the interventions, PE reported the financial problems and bad physical conditions of secondary schools, while SD highlighted the physical problems inherent in old buildings, and the wear and tear that they have been through for several decades in tandem with questionable maintenance management.

In summary, historic *liceus* are architecturally significant because the original design of each building has mostly been preserved, including the original spatial and functional locations. Several changes have occurred in the educational curriculum; however, specific *liceal* spaces considered to be identity spaces were still preserved in use after the unification of the secondary educational system in 1974. The classrooms, library, laboratories, gymnasium, direction and administration rooms have retained their use and original locations, contributing to historic *liceus*' authenticity and integrity. Along with historic decayed fabric, changes in buildings due to former alterations and/or additions, are evidence of wear and tear from intensive use, all of which are evidence of the *liceu*'s history and uses (ICOMOS Australia, 2013) and elements of its significance. Existing fabric and their condition constitutes evidence of cultural significance; however, the lack of maintenance affects the place's cultural significance. The evidence found in documents and interviews confirmed that the overall condition of historic *liceus* 'was severe' (Marques, de Brito and Correia, 2015).

6.3.3. Design Values of Furniture, Fixtures & Contents

The previous analysis of fabric assessed the values of the physical materials of historic *liceus*. This section completes the meaning given to the term 'fabric' by the Burra Charter by focusing

on understanding the cultural significance embodied in the other components of fabric: 'fixtures, contents and objects' (ICOMOS Australia, 2013, p. 2). FF&C means fixed, fitted or moveable objects, collections, documents, works of art, etc. which have been assessed as being integral to the cultural heritage value of historic *liceus*. The reason for such an approach relies on the personal experience of the researcher in the rehabilitation of two types of historic *liceus*. Both had a significant amount of fixed and loose objects, some with no permanent connection to the structure of the building.

The value of FF&C is closely linked to the places for which they were created, and they have the ability to trigger memories and reveal family and community histories, as generations of students have attended secondary education in their parents' *liceu*. As past educational resources, they reflect past education methods and the cultural identity of those who used them by inducing self-esteem, ownership, and sense of collective purpose. These materials are closely related to the history and development of education. Therefore, fixtures, historic furniture and scientific collections contribute to the significance of historic *liceus*.

Furniture

The original furniture of historic *liceus* was purposely designed at the time, as it was a new need (e.g. 3DG, 4FL). Following international practice (Müller and Schneider, 2010), schools desk-chairs and chairs and tables were designed according to the aesthetic of the time, producing a cultural artefact with cultural value. The ability of these objects to trigger memories is important for the establishment of the cultural significance of *liceus*. For example, it can be observed with some frequency that when a former student goes back to his/her primary or secondary school, they instinctively sit on his/her former desk and remember past events.

However, in 2007 photographic surveys of ARCH and PE showed some purposely designed furniture had already been replaced by new furniture, particularly students' chairs and desks. The case of the physics and chemistry amphitheatres in 1PN, which had been removed by the end of the twentieth century (1PN-SD, 2011), is an example of the lack of awareness of their heritage legacy and of the history of education (see Figure 6.18). Each *liceu* had its own specific furniture purposely designed, in harmony with the design of the building itself, although using similar materials, such as wood types. One exception was found in the *Estado Novo liceus* where a standardised design started to be generally applied in public buildings.



Figure 6.18. 1PN: physics amphitheatre (1928). Source: Novais Archive/FCG ref. CFT003 055152, at <https://www.flickr.com>, accessed 18-12-2013.

As schools with a focus on Science and Arts, as in the case of OPM, scientific collections were originally the main vehicle for conducting experimental teaching, advocated by the 1905 Education Law. Ever since then, these areas have been given specific rooms, such as chemistry or physics laboratories, drawing or natural sciences rooms, where the walls were filled with purposely designed cabinets displaying the instruments, species, or models to be studied, as in the case of the traditional moulds of plaster cornices found in OPM. Lockers, the headmaster's chair and table and the teachers' chairs and tables were all originally designed by the architect who designed the building, as referenced in interviews with SDs (1PN-SD, 2011, 2RF-SD, 2012, 3DG-SD, 2012, 4FL-SD, 2011).

In the *Estado Novo* liceus, the design of the building and of the furniture was centralised in the JCETS. A recent exhibition on furniture in the *Estado Novo* period (Martins, 2015) illustrates the importance of such elements in public buildings. As the exhibition curator João Paulo Martins explained, in 1940, and within the Ministry of Public Works and Communications, a Commission for Furniture Acquisition (CAM) was established, setting out design guidelines for public buildings' furniture. By then, exceptional wood from the Portuguese colonies – such as *macacauba*, *bissilon* and African mahogany – was used to produce desks, chairs, library bookcases, laboratory and science room benches, etc., including the fixed furniture in the reception and administrative rooms, and in the oldest cases, the rector's accommodation furniture (4FL, 5CM, 6DM) (see Figure 6.19).



Figure 6.19A and B. 4FL library: Art Deco furniture (2007). Source: Arch3.

Although no longer in use, the research value of original furniture, equipment and technodidactic educational collections was recognised by PE (PE-DD, 2012) and in academic studies, as for example the research on the collection of wall resources from the *Liceu Nacional de Passos Manuel* (OPM) (see Figure 6.20) originally used in school daily life and currently in the process of becoming lost due to neglect and deterioration (Lopes, 2004).



Figure 6.20A and B. OPM: Stuffed animals' collection and mineral collection (2007).

Fixtures

Within the immovable heritage, which constitutes the *liceu* building, there can be found a range of fixtures of heritage significance in historic *liceus*, such as built-in furniture, or fittings such as classroom and office furniture, filing cabinets, cupboards, shelving and display cases. Furthermore, historic libraries were also specific rooms where fixed cabinets were designed and built on site. These objects have been specifically created for the purpose of teaching and learning and are therefore an important part of the place identity. Other type of objects are art

objects, such as decorations and ornaments on walls or facades (OPM paintings, 3DG tiles, 2RF and 5CM sculptures); inscriptions (4FL); commemorative plaques (2RF); and lettering (3DG), etc.

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Based on an analysis of the architect's photographic survey (2007), the historic Portuguese *liceus* took hold of a range of historic movable educational resources, which contribute to the significance of these education places due to their educational, scientific, technological and social historic values. Scientific collections used in the beginning of the twentieth century for direct observation and experimental education are part of places' history. *Liceus* used a range of historic movable educational resources with artistic, scientific and technological historic value, which can be divided into the following categories: student records, historic books and historic management documents (all cases); scientific collections (OPM mineralogy and botanical specimens, stuffed animals); sciences collections (physics and chemistry devises and other laboratories equipments 2RF, 6DM); and map and chart collections (OPM, 2RF), etc.

For the history of *liceal* education in Portugal, the scientific value of collections is recognised (Lopes, 2004, Gomes and Lourenço, 2014). Equipments that belonged to personalities which have taught in the *liceus*, such as the case of *Rómulo de Carvalho* (1906-1997) in 1PN, an outstanding Portuguese scientist, science historian, poet and teacher, were still in place and were kept in a museum room along with anatomy models and formalin-preserved samples of animals, and wet preserved specimens of plants and seeds (see Figure 6.21). In 4FL, the display units contain ceramics collections, sculptures and other artefacts and remains of the Colonial Museum (Nóvoa and Santa-Clara, 2003), organised by a Delegate of the *Mocidade Portuguesa* (4FL-SD, 2011).



Figure 6.21. 1PN: sciences classroom (2007). Source: Arch1.

In 2007, original furniture, equipment and didactic collections – such as *Animalia*, *Vegetabilia* and *Mineralia* (Leal, 2007) – still remained in *liceus*, mostly in their original locations. In general, the furniture is diverse, still including original objects. Such diversity clearly illustrates the loose/unplanned measures that have been in place for schools maintenance, as referred to by ME (2012). Although most of the furniture displays which enclosed special historic collections were found in place, their degradation was visible in photographs and in descriptions of SDs. The same happened with objects from the laboratories. The maps, charts and parietal images found in *liceus* (e.g. OPM, 2RF) were originally used for the subjects of physics and chemistry, natural science, history and geography. These collections were kept in cabinets purposely designed and built on-site to protect and archive them. The director of 1PN referred to the research interest shown by researchers in the former students' records, as some have become public figures, many in politics (1PN-SD, 2011). Fixtures such as the original black boards and teachers' wooden stands, (see Figure 6.22) have been replaced in most *liceus* classrooms. While the change of blackboards to whiteboards was related to the improvement of air quality, due to the chalk dust, the removal of the wooden stands is related to the 1974 Democratic Revolution, bringing into the classroom an idea of equality replacing a traditional power relationship between students and teachers.



Figure 6.22. 5CM classroom with black board and wooden stand (2007). Source: PE.

In summary, as recognised in Heritage Protection Charters, FF&C are heritage assets that have contributed to the identity of the *liceu*, to the transmission of an idea of tradition, of time, of heritage, which complies with the messages and stories told by some of the students' parents, when talking about their times of secondary education passed on these places. *Liceus* were the places where the most recent educational resources were used to teach and to learn: wall maps, charts and images constituted the teaching resources that emerged in the nineteenth

century, were used in the twentieth century and have suddenly been replaced by digital technologies.

The value of these elements was emphasised by some SDs (e.g. 1PN). The research found that, the more recent the *liceu*, the fewer items of historic educational resources were in place, with the Eclectic *liceus* having the largest educational collections. Currently, the condition of historic *liceus* didactic collections (Gomes and Lourenço, 2014) following international research on material legacies of education (Lawn and Grosvenor, 2005, Müller and Schneider, 2010), aims to know more about these collections with the aim that they should remain in place (ICOMOS Australia, 2013, p. 9). Regarding historic furniture, it was observed that each school had its own specific furniture designed for purpose, according to the design of the building itself. Furthermore, the architects used similar materials, such as similar wood types. Exceptions were found in New State *liceus* where a standardised design had started to be applied as design became centred in Government Offices and no longer in private architectural practices.

The following section assesses if current users of historic *liceus* perceive the authenticity and integrity of the established cultural material values as being affected by the physical, functional, spatial and environmental problems.

6.4. Socio-Cultural Values

This section aims to answer the questions on which aspects were considered of worth or importance in historic *liceus*. Which qualities were recognised in historic *liceus*? Which values were attached by stakeholders to which qualities of historic *liceus*? This section assesses how these values were perceived and sensed before rehabilitation interventions. The historic and material cultural values assessed in the previous section contribute to the intangible values which give significance to a place. The assessment focus on values ascribed by participants from the rehabilitation process – targeted users and owners – who are recognised as having an interest in the heritage, as suggested by Mason and Avrami (2002, p. 21).

The assessment of 2007 values was conducted in 2011, after *liceus* were rehabilitated, so the results of the survey should be viewed in that context. Caution in the interpretation of results is advisable. It is generally perceived that people only recognise the value of something when that something is affected, or is intended to be affected. What triggers valuation is usually the

fear of unknown change, or unknown effects of change. As this research assessment asked for what was valued before interventions took place, after interventions have been completed for one year, there was no fear about future actions and it enabled participants to compare the end results with the previous situation. Although this is a strength of the tool, some participants, either in their interviews or in the questionnaires, believed that not enough time had passed for them to really understand the results of the interventions. Although recognising the theoretical support for such an idea, as it reflects the impact of intervention being long-term in nature, it further denotes the lack of perception of the benefits that short-term assessments may have for the sustainability of cultural heritage, as this thesis argues. The research further considers that immaterial values should be assessed, hence the first perceptions of using rehabilitated historic spaces and new added spaces could reveal initial reactions to some important issues, when compared with the situation pre-intervention. The freshness of such perceptions can only be captured at this stage.

As a retrospective evaluation, participants were asked to remember the *liceus* before the interventions, giving the youngest students (who supposedly had not been in the *liceu* two years ago) the opportunity to use their imagination and describe what they thought the place originally looked like. The socio-cultural data gathered revealed some preliminary themes which will be discussed in the following sections.

6.4.1 Evidence from Social Data on Historic *Liceus* Values

Acknowledging that, at the survey stage, the research focus was mainly on material values and on the design process, the data obtained shed some light on the understanding of which issues were most valued by participants. This preliminary report of the findings is now approached by data source, i.e., by participant type: teachers and staff, students, school director and owner. It will be assessed if different groups identified the same qualities of place and, if so, if they valued these qualities similarly

Teachers (D) and Staff (F)

The following table (see Table 6.4) summarises the perception of the heritage value of the buildings according to teachers and staff, when asked to explain the option of rehabilitating, instead of demolishing the *liceu*, and building a new secondary school (Q10D).

values	reasons for rehabilitation (most identified, to less identified by users groups)	1PN		2RF		3DG		4FL		5CM		6DM	
		Teachers	Staff	Teachers	Staff	Teachers	Staff	Teachers	Staff	Teachers	Staff	Teachers	Staff
existing	Historic (national, age, building type)	x	x	x	x		x	x	x	x	x		x
	Architectural (design, quality, authorship, aesthetic, style, landmark)	x	x	x		x	x	x	x	x	x	x	
	Place identity/character			x	x		x	x	x	x	x	x	x
	Urban (landmark, location, city, neighbourhood, accessibility)	x		x		x	x	x		x	x		x
	Construction (quality, security, robustness, materials, infra structures)					x	x	x		x	x	x	x
	Political (education)	x			x	x	x		x	x		x	
	Cultural (heritage preservation, listed)	x		x		x		x	x				x
	Economic	x		x	x	x		x		x			
	Social (collective memory, traditional, educational, school of reference)	x	x	x				x		x	x		
	Grounds (green area)												x
need to change	Physical enviroment conditions				x				x	x	x		x
	Use (adapt)												x

Table 6.4. Question 10D/10F: Reasons for rehabilitating historic *liceus*.

The results show that a range of value categories was used by teachers and staff, as found in the literature. Historic values and existing material values (e.g. architectural, urban, construction) are preferred to political, cultural or social values. Open-ended questions provided additional data. Some teachers knew the name of the original architect, therefore considering the authorship value of the building. The identity value given by the urban character was stressed by a teacher who considered that ‘the buildings are an urban landmark and an integral part of the collective memory’. The political value of education is recognised by one teacher who said: ‘the government idea that it should leave work done regarding education’, with another teacher considering it was a ‘cultural option: preserve the heritage’, supporting the political decision.

Among the staff, the physical condition of the building was referred to as the main reason why it was rehabilitated: ‘to improve the conditions for students, users and staff’. The age value was stressed by staff; for example, 1PN was considered to have national historic national

value, as it is 'a centenary school', with educational value: 'considered a landmark in education, because it is a school with a long tradition'.

Students (A)

Students were asked to describe the *liceu* before rehabilitation using the acrostic activity and the word *LICEU*. The quantitative analysis of students' acrostics was visualised in Word clouds. The assessment turns now to the 1PN answers of the oldest and the youngest students, as an example (see Figure 6.23)



Figure 6.23. 1PN|12: Word cloud of Acrostic *liceu*: all and 10 most frequent words used by the oldest students.

The oldest students of 1PN considered the *liceu* to have been 'unique' (mentioned 7 times), 'incredible' (4), 'beautiful' (3) and 'excellent' (3). In the research context, the value associated with unique, usually associated with a scientific value of rarity, can be interpreted as an aesthetic sensory perception, a place where students feel special, like in no other place. In 1PN, this sensation is enhanced by the idea of status given by the attendance at *liceus* institutions, found in the words 'legendary' (4), 'elitist' (2), 'a prestigious place', 'incomparable', or 'an educational facility very important and well known'. This student also considers 1PN to be 'a school capable of appropriately educating men', addressing the educational value of the institution, using an expression which seem to have been transmitted through previous generations. This generational value, i.e., the fact that people from different generations were educated in this *liceu*, is expressed in the expression 'full of history and of stories of those who have been learning here'. The physical condition of the building is identified in 'a little worn out with time'. And finally, a nostalgic value can be identified in the expressions 'a relevant part of my life', 'it was a school with a soul' and 'a school that will never be the same again', suggesting their affection for the place before any intervention took

place, and also an idea that they will be leaving the school at the end of the academic year, as they finish secondary education.

Turning now to the youngest students of 1PN: of the 22 young students encountered, only five responded to the acrostic activity, providing only 30 answers out of a possible total of 110, which demonstrates how unsuccessful this method may be. The given task – to imagine how the school was in the past, before rehabilitation – was a situation that students had not experienced before, for which the use of the word 'imaginable' is believed to illustrate some difficulty in filling the form. However, and for unknown reasons, the youngest students from 1PN were the only group in this research that left this activity incomplete. Nevertheless, it was found that the word most used was 'unique' (mentioned 6 times), 'important' (3), 'beautiful' (3), and 'spectacular' (2). Note the reference of 'urbanized' in reference to the setting, and to the use of the word 'unforgettable', which links to memories of the past situation.

In summary, and in all schools, students mostly described the *liceu* as the place where they have learning and social activities, and the relationships they experienced within it. This evidence of the social value of a school, emerged more strongly than references to the built environment. However, some spaces were mentioned that are part of the identity of *liceus*, such as the classrooms and the sports pitches. The outdoor areas were most referenced.

School Directors (SD)

Interviewees were asked to talk about the period before interventions and explain: 'What was the value of the school? What was the building like, from a physical and functional perspective? What were the physical problems/needs?' (see the interview schedule in the Appendix). Through conversation, it was clear that school directors shared the sentiment about the poor conditions of the buildings, although had different perceptions of *liceus*. They all demonstrated an interest in participating in research on *liceus* which focused on architectural heritage, suggesting an awareness of the historic value of the buildings and, perhaps, a desire to discuss the interventions and have their opinion considered. Interestingly, in 3DG one teacher wrote: 'please report the truth', suggesting that, in this participant's view, previous assessments were not being faithful to the reality. Again, as an example, interviews with the school director of case 1PN is reported.

The 1PN-SD narrative started by reminding the research of how old the building was and presenting the physical problems found in 2007. The wear and tear of the building was acknowledged to be due to its intense use: 'the facility had no time to rest, not even to be

properly cleaned', with full occupation from 8:15 till 00:00' (1PN-SD, 2011). The reduced quality of the teaching environment conditions is illustrated as justifying the negative effect on teachers' motivation. Functionally and spatially, the building was recognised as 'no longer adapted to the education requirements and to the students needs', due to 'the changes in education and in curricula for the last 100 years' (idem).

The relationship with the urban context was stressed by explaining that the school was open to the community for the use of the gymnasium after classes, every weekday. The public image of the school was a concern, for which the students' entrance was changed so that orderly and better controlled access could take place, along with the displacement of fights and smoking from the school main entrance, away from the very visible and busy avenue.

On contents, 1PN-SD stressed (twice) the research value of the archive, which contains records of former students that became significant in Portuguese history, to add a comment on the unsuitable environment conditions. Furthermore, furniture heritage was highlighted as a personal project as she said: 'I was conscious of the value of the furniture'.

Social values sensed by the school community were mentioned. The most striking was related to the idea that teachers are the carriers of memories: 'The memory of the school will change from now on due to the renovation speed of the teaching faculty' (1PN-SD). Due to retirement conditions that changed recently, many teachers retired and new teachers are arriving at the school. It was further mentioned that there was a lack of space and time for staff to establish contact with other colleagues in the school, which would contribute to the transmission of the school values and enhance the pleasure of working there. She illustrated this by saying that the former director passed her knowledge and pedagogical spirit of the school to her, from one generation to the other. Therefore, when stating that 1PN 'is a school of generations', it means the teachers as well as the students.

A sense of miss values was transmitted when referring to the importance of visibility of maintenance interventions: having taught in the school for 21 years, her memory only recorded one 'deep' maintenance intervention, although smaller ones were made by the school board which 'didn't shine, were not seen'. Further highlighting the work of the school board, she added that the laboratories had always been updated – an emphasis on the traditional experimental ethos of the *liceu*.

Owner (PE)

Similarly, interviewees from PE were asked the same questions (see interview schedule in appendix). As the questions on the three moments – before, during and after interventions – were set out at the beginning of the interview, the time spent in this stage was less than on processes and results. The ME focus was clearly political, stressing for example the political consequences of the general degradation of the conditions of *liceus* (the loss of students and directors' lack of satisfaction), how financial support was granted, and how the programme could be extended from the historic *liceus* in Lisbon and Oporto to secondary schools nationwide (ME, 2012). The buildings area director stressed the structural anomalies in historic buildings that needed urgent attention (PE-BAD, 2011), and the deputy director mentioned the publicly recognised education heritage value of historic *liceus* as a 'a symbolic recognition, mostly because it received several generations' (PE-DD, 2012).

In summary, in the description of the *liceu* before interventions, the importance given to the cultural values of historic *liceus* is highly reduced. Those who expressed the values of the place, not of the building, more clearly were students, who stressed the importance of *liceus* as 'their' learning environment. Oral evidence gathered was mostly focused on the physical conditions of *liceu* buildings, with each stakeholder group stressing different perspectives, not generally focused on the heritage values of the *liceu*.

6.4.2 Sensing the Historic Context

The first approach to social data gathered in acrostics, among students, aimed for the establishment of themes that would relate to the physical environment, as it would be the physical environment that was about to change. The following table summarises the most used words by all of the students in all of the cases (see Table 6.5).

Values Categories	social	safety	ethos	design	environment	use
LICEU						
Youngest students	united		special, important, stable, cultural, irreplaceable, <i>Lisbon</i> , single	beautiful, interesting, built, ultra-ugly	clean, spectacular, warm, strange, stupendous, inexplicable, unbearable	useful, educational, high school, imaginary, imaginative, full, educator
Oldest students	united, free, community, cohesive		special, unique, legendary, known, important, elite, legend, knowledgeable, located, <i>Lisboeta</i> , charismatic, college, commented	beautiful, interesting, complicated, confusing, complex, incomplete, light, full, impressive	spectacular, clean, excellent, amazing, warm, strange, quiet, splendid, intense, selfish, internal, incoherent	useful, educational, competent, industrious

Table 6.5. Acrostic Results in all cases: words repeated at least two times/case.

The retrospective data gathered on the *liceu* before interventions seems, at first, not very clear, or helpful for the research. However, the environment, which is known to be in very bad conditions, is considered spectacular, clean, amazing, with few negative adjectives being used. The aesthetic has been recognised in the word 'beautiful'. Interestingly, the most striking results are those related to the ethos of the school and the use of the place. Students value the education they get in these environments (useful and competent), as well as the prestige of the historic *liceus* (legendary, unique, elite). One of the schools was clearly identified as a symbol of the city. The analysis was found difficult but very useful for a comparison with the words used to describe the place after the interventions (see Chapter Eight).

6.5. Heritage Values

This purpose of this section is to identify the heritage values used to propose the listing of historic *liceus* and the values recognised by official heritage entities, IGESPAR at national level and municipalities at local level.

6.5.1. National Value of Historic *Liceus*

Listing processes highlighted different time priorities in the stages of the listing process. The opening starts with a proposal that is evaluated and then the process is open or not. In 1PN,

the process was opened six months after the proposal and in three weeks the building was considered 'waiting to be listed'. Another example was found regarding two cases (2RF, 3DG). In 2005, the president of the IPPAR considered the need to list Portuguese architectural heritage of the twentieth century as a public recognition of the exemplary architectural and sociocultural values of four secondary education facilities, perhaps due to the perception of future interventions.

State, schools and citizens have proposed the listing of *liceus*. The first proposal ever presented originated in a school itself at the end of the twentieth century by the then-President of the Direction Board, recognising the important location and the design authors, the fact that it was built for purpose, and the archive and museum historic documents which were being researched by the Ministry of Education. This fact denotes the awareness of the content of the building that was being recognised and preserved above the building in itself. A similar situation took place ten years later when a citizen proposed the listing of 1PN in 2006. The proponent considered the building to be an exemplary work of the architect, a reference in architectural heritage of the twentieth century, the place of formation for one century of distinguished figures in all areas, and the occasion of the celebration of the first centenary of its creation justified the pertinence of the proposal.

IGESPAR appraisals use criteria for listing as established by Law. The next table (Table 6.6) shows the heritage values found in the consulted listing processes of each case, here organised according to the legal listing criteria.

Property Listing Criteria	OPM	1PN	2RF	3DG	4FL	5CM
Date of listing proposal	19-08 1996	28-06 2006	21-07 2005	21-07 2005	6-10 2009	09-08 1945
Proponent	the school	private	IGESPAR Presid.	IGESPAR Presid.	Heritage DRCLVT	Planning DGSU
Date of consultation	03-02 2012	15-07 2011	29-06 2011	12-04 2012	30-06 2011	29-06 2011
a) The matrix character of the asset				X	X	
b) The genius of its creator		X	X	X	X	
c) The asset interest as a symbolic or religious witness						
c) The asset interest as a remarkable testimony of experiences or historical facts						
e) The aesthetic (A), technical (T) or material (M) intrinsic values of the asset				ATM		
f) The architectural (A), urban(U) and landscape (L) design		U		A	A	U
g) The extension of the asset and that it is reflected in the asset regarding the collective memory						
h) The historical (H) or scientific (S) research importance of the asset				H		
i) The circumstances which might involve decrease or loss of continuity (C) or integrity (I) of the asset						
other: antiquity, authenticity, originality, rarity, singularity						

Table 6.6. General criteria used for the purpose of listing.

Case 5CM is an example of some of the unfinished listing procedures found at IGESPAR. Although its listing procedure was opened due to former legislation, which established a protection area for public buildings with high architectural value, it was closed in May 2008 because it was considered to have 'no heritage value of national level'. This decision to cease protection indicates that values change according to context: during the dictatorship, state buildings had architectural value, but in a democracy, these values are not recognised. The process consultation found the justification to remove protection:

'Despite the obvious architectural quality of the old building of the *Liceu Carolina Michaelis*, and its importance in the context of urban development of the city, this property does not seem to embody architectural or historic values of particular importance. Therefore and due to the general and additional criteria for listing as fixed in the work published by IPPAR in 1995, this property does not meet the exceptional characteristics to be considered of public interest. The case should be closed'.

The contradiction is eminent. Furthermore, no reference was found regarding 6DM, the other case study from the *Estado Novo* period. However, the fact that *liceus* buildings from this period were not considered for listing can be interpreted in three ways: due to the period of construction, due to the amount of time that has passed since construction, or due to the amount of examples of this type of buildings. The first and last hypothesis seem plausible as the amount of public buildings produced with the aesthetical expression of the *Estado Novo* in this period (1933-1974), including 13 *liceus* buildings, is significant. Beside schools, the government invested in law courts, hospitals, railway stations and post offices. Listing buildings from this period requires deep consideration as once listed, buildings are required by law to be maintained, which means costs for buildings that do not provide any financial income, such as those opened for tourism. Therefore, the more buildings listed, the more financial support will be needed from the state. The second hypothesis suggests that the required historic distance to establish historic values has not yet been achieved. Memories of the dictatorship period are still alive in the memories of citizens, and the term '*liceu*' is still connected to an elite education – an interpretation supported by the students. Therefore, the justification that these *liceus* do not 'embody architectural or historic values of particular importance' cannot be accepted as the architectural style of these buildings, named *Português Suave*, recalls the *Estado Novo* period. This symbolic value of an unpleasant past indicates some unresolved historical, which those responsible for heritage listing have not yet overcome. In 2007, IGESPAR was campaigning for the *Listing of the Architectural Heritage of the twentieth century* (CPAS). Considering the following statement, it can be found that there were diverging opinions regarding what should or not be listed among heritage officers: 'In some countries, buildings with less than 50 years or designed by living authors, are not listed'. The heritage official further beliefs that there are other ways to enhance and safeguard contemporary architecture, such as by including such buildings in safeguarding plans and by promoting architectural awards, and concludes that the topic should be debated in order not to 'trivialise the classifications by making them extensive to the entire heritage of the twentieth-C'. An idea further found in the 4FL listing process, issued by the IGESPAR advisory board, is that: 'classifications should not be trivialised'.

The 'relative value' of *liceus* as a building typology considered the older buildings, not including the *Estado Novo* period, and those designed by highly regarded authors. This fact indicates that historically, schools have been designed by architects who tend to apply their knowledge and reflect their contemporary time in the architectural expression of their designs as a continuous expression of their personal professional design pursuits.

6.6.2 Municipal Protection and Significance

Historic *liceus* are identified in Municipal Master Plans (PDM) –local planning legislation. The PDMs of Lisbon (1994), Oporto (2005), Beja (2000) and Coimbra (1994) were set in Law when consulted for this research (April, 2012). It was found that in Lisbon all three cases (OPM, 1PN, 4FL) were listed in the Municipal Heritage Inventory (according to Article 13); in Oporto, only 2RF is considered an 'asset of heritage interest' (according to Article 45, and is included in the city Heritage Charter). No reference is made to 5CM. In Coimbra, 6DM is listed under Article 15, a) School buildings, as a 'public building', therefore requiring a buffer zone. Finally, in Beja, it is generally considered under the Chapter 'Built Heritage - Listed Heritage - Immovable heritage listed or waiting listing: protection to public infrastructures and facilities, school buildings'. Questioning the municipality, it was confirmed by email that 3DG is a municipal-protected building, according to the Architectural Heritage Inventory of the Municipality, for it is to be included in the next PDM revision. However, none set out the values under which the protection has been established. In summary, municipalities established protection degrees for historic *liceus*, which are to be protected as Municipal Heritage (in Lisbon, Oporto, and Beja) or as a public school building (in Coimbra). This *Estado Novo liceu* 6DM has some protection, while 5CM does not have any protection under Oporto PDM.

6.6.3 State Inventory of Architectural Heritage

The following table shows the degree of 'buildings quality' and of completeness of the State Inventory of National Architectural Heritage (IHRU-SIPA) records. Different quality grades have been attributed to the small amount of *liceus* records: OPM and 3DG were considered to have higher quality than 1PN. The inventory further indicates that 2RF, 4FL and 6DM records are still at pre-inventory stage, therefore graded 5 and 6 (see Table 6.7).

Considering the objectives of this database, striking findings came out of the analysis of the previous table. First, the consideration of 1PN as not having value *per se* but for its role in the urban landscape. Secondly, the lack of importance given to 2RF, 4FL and 6DM, as there are only records at a pre-inventory stage with elementary data. And finally the absence of record for 5CM, when 6DM has had a listing record opened by IGESPAR. The comparison with IGESPAR records shows how different inventories assess *liceus* as architectural heritage, and how important it is to establish clear and coherent assessment criteria for heritage values.

Building types	Eclectic liceus			Modernist liceus		Estado Novo liceus	
Case studies	0PM	1PN	2RF	3DG	4FL	5CM	6DM
IPA Grades (Criteria)	2	3	5	2	6	No record	5
The importance of their authors, locally, nationally or internationally	X	X	X	X	X		X
The importance of projects regarding its regional or national scope	X	X	X				
The quality of insertion in the territory	X	X					
Authenticity							
The frequency in a restricted territory	X			X			
Document historical, social and cultural moments	X	X	X	X			
Aesthetic expressions	X	X		X	X		
Construction techniques (local, regional or national) very specific and in danger	X			X			
Current practices in a given community	X	X	X	X	X		
Symbolic or legendary values	X	X					
Scientific values							

Table 6.7. IPA grades established for *liceus*. Source: www.monumentos.pt, consulted 03-02-2014.

6.6. ERECS Tool: Gathered Inputs for Rehabilitation

The first stage of the conceptual framework ERECS was used as a starting point for the analysis of the cultural values of the six cases studies, in order to establish their significance and understand how and why are historic *liceus* important architectural heritage. In this stage, ERECS proposes a holistic evaluation of cultural values of historic *liceus* before interventions, in this research retrospectively conducted, establishing historic and contemporary values, material and immaterial cultural values, recognised and used values, framed by the current condition, integrity and authenticity of places. Data on these categories were found by analysing historic documents, by interviewing users of the setting, and finally by analysing official heritage listing documents. Following the gathering of qualitative data on historic and

contemporary, material and immaterial values, as interpreted by the researcher and perceived by historic *liceus* stakeholders, a contextual content analysis was conducted.

All attributes found in the literature review were relevant. Considering that as time separates participants from past events, emotional engagement is reduced (Uzzell and Ballantyne, 2008), attention should be given to the fact that it was a retrospective evaluation, for which some values might have been forgotten, replaced, or just not considered relevant now, after rehabilitation. New attributes emerged, leading to their inclusion in the framework. The framework was adapted to the following structure (see Table 6.8).

Categories of Values of Architectural Heritage (sources)	
Evidential Values (embedded in fabric)	urban (site), architectural (building), function (contents)
Experienced Values (sensed by communities)	contemporary (targeted stakeholders' groups)
Instrumental Values (recognised in legal protection)	historical (heritage records, historic texts and documents)

Table 6.8. Conceptual Framework of Architectural Heritage Cultural significance

6.6.1 Significance of Historic *Liceus*

The significance of the architectural type *liceus* was found in the original design, where the importance given by the State to public secondary education was expressed, through urban location, landscape and architectural image. The *liceu* building is the product of the artistic and construction technical achievements of the period of design, as interpreted by an architect, and therefore with his individual creative stamp. The *liceu* has a spatial-functional layout, dimensions and inherent contents, which equipped them for *liceal* education and made them adaptable to secondary education. The development of historic *liceus* since their original construction reveals the adaptability of the buildings and outdoor areas for the inclusion of new volumes, which did not affect the original attributes of the place, indeed preserving its authenticity and integrity. In 2007, the perception of the school community regarding the *liceu* is centred on the use of the place for education and leisure, for learning and establishing social connections. More negatively, the facility is remembered as being in a bad physical condition

and as a former place of discrimination, either of gender or social class, entailing symbolic values. The institutional values support these conclusions.

6.6.2 Reflective Thoughts

The process of analysis and the use of the framework have proved useful in the assessment of the six case studies' cultural values, highlighting attributes that are significant for the building typology. However, some challenges which have emerged include the importance of intangible values, requiring a deeper attention of the research to feelings, opinions and memories of stakeholders, in line with Petzet's premise: 'The preoccupation with what we try to define as intangible heritage may also contribute to a broader emotional basis of conservation practice, which can help us in the daily fight against the progressive world-wide destruction and decay of our cultural heritage' (Petzet, 2003, p. 3). These findings contributed to the inclusion of a deeper examination of social data rather than a focus on historical and material culture data, as an architectural approach was initially considered. However, this rationale is always framed by the knowledge that significance can change over time, for example due to changes in government, for this assessment is a mere snapshot of the current context and the framework is flexible enough to include, remove or change categories or attributes of historic schools.

Acknowledging that this evaluation tool entails a subjective process, due to the analysis of qualitative data, the proposed model for the assessment of cultural significance change offers a flexible tool that assess a complex reality, such as the socio-cultural context in which architectural heritage exists. The tool can be adapted to other types of categories or attributes, according to the typology or the context in which the assessment is being made. However, one of its strengths is the fact that it facilitates the comparison of architectural heritage, which was here tested, contributing to the assessment of cultural values and of significance.

In summary, the ERECS tool was found to be effective in retrospectively establishing the cultural values of each historic *liceu*, gathering relevant inputs for rehabilitation interventions. The test of the tool in six historic *liceus* enabled the researcher to establish patterns of heritage values shared as a building typology, by its history, its physical attributes and the perceptions provided to its stakeholders. Revision of the framework included the inclusion of an emerged category of social values: 'sense of place dependence'. This framework will facilitate the comparison of results of architectural rehabilitation, to be conducted in Chapter Eight.

6.7. Chapter Summary and Conclusions

This chapter has demonstrated the historical, architectural and socio-cultural values recognised and used when establishing the cultural significance of the historic Portuguese *liceus* at the beginning of the twenty-first century, based on three issues. Firstly, in the fact that they are unique examples of the development of *liceal* education in Portugal in this period, bearing witness to the main characteristics of this building type. Secondly, there are historic physical characteristics that best identify the historic values of *liceus*, such as the setting, the building and the content. Thirdly, and finally, the value of the architect changed from the first directly commissioned *liceus* to public competition, with public servant architects later changing the design to benefit the nationalist image. Therefore, the creative genius of twentieth-century architects (ICOMOS ISC20C, 2014) is a significant historic value of historic *liceus*.

According to EH, 'change to a significant place is inevitable, if only as a result of the passage of time, but can be neutral or beneficial in its effect on heritage values. It is only harmful if (and to the extent that) significance is eroded' (English Heritage, 2008, p. 43). Therefore, in this chapter, 'intensive studies of what exists, what has been altered and also what has been lost' (Burkhardt, 2003, p. 31) were conducted. Therefore, it can be said that the significance of the cultural material values of historic *liceus* have been safeguarded, considering that the original design was preserved in its authenticity and integrity, and that the additions made helped to keep these heritage resources in use.

The key material features of the historic *liceus* buildings are:

- Compact two or three-storey buildings with large surrounding private areas
- Walled plot, with transparent fence
- Plot entrance through main gate, with entry control
- Symmetrical main facades
- Axial entrance in the building, through the main facade
- Interior layout with teaching and non-teaching spaces
- Classrooms located on both floors with direct access to long interior corridors.

These findings are in line with the literature on twentieth-century Portuguese architecture (Tostões, 1995, Ordem dos Arquitectos, 2006, Becker, Tostões and Wang, 1998) and the

history of building construction and materials (Tostões, 2004b). Therefore, the above mentioned historic values are also the architectural values of *liceus*.

Generally, public authorities have given custodial protection (ICOMOS, 1964) to *liceus*, formally recognising the building typology as significant. Public historic values to be preserved have been established and are used as an instrumental tool to protect cultural values, as they are considered beneficial for the public, for communities and in general for society as an example of culture. Inventory schedules complement the unlisted historic *liceus*.

The literature review suggested that there has been a lack of attention given to the listing of twentieth-century architectural heritage, particularly more recent examples of less than 50 years' old, which was confirmed by the case of the *liceus*. *Liceus* demonstrate a lack of recognition of the *Estado Novo* architecture as an important period of Portuguese cultural production, particularly as it is known that there are only 13 of these building types. Therefore, the recognition of *liceus* as national heritage is an incomplete task.

The assessment of the cultural significance of historic *liceus*, as a building typology, is a complex issue as each case must be evaluated independently. Nevertheless, this chapter established the historic context in which *liceus* were designed and built, demonstrating that historic *liceus* of the first half of the twentieth-century are significant in illustrating the development of education and urban planning policies, aesthetic styles and construction technology in Portugal, establishing the historic values as being documentary and scientific. The findings from individual and cross-case analysis of groups of *liceus* from different periods are supported by the literature, which establishes that an historic thematic framework, based on historic issues, is suitable for the assessment of architectural heritage significance (MacDonald and Ostergren, 2011).

Historic and original attributes contribute to the recognition of the *liceu's* identity, which further contributes to users' sense of place and place attachment. Even reporting that the physical condition was problematic, a sense of utility and aesthetics was found in participants responses regarding these places. Therefore, historic *liceus* comply with the following cultural significance criteria:

1. They constitute a distinct building typology;
2. They demonstrate the exceptional and unique aspects of Portuguese cultural heritage;
3. They provide an insight into Portugal's architectural, technical, social and educational history;

4. They are representative of a broader class of public architecture from the twentieth-century;
5. They demonstrate a high degree of creative and technical achievement;
6. They have special meanings for groups and communities because of their architectural, social and educational associations;
7. They have a special association with the work of its architect, with the life of relevant individuals in current society, with *Mocidade Portuguesa*, and with a political regime that were important at national level.

Consequently, historic *liceus* have the potential to enhance human development and to contribute to quality of life and sustainable development, for which their cultural significance should be preserved (Council of Europe, 2005). In the specific case of the rehabilitation process of historic *liceus*, the acknowledgment of 'design input values' accessible at the pre-design stage, as established here, can now be further compared with the values assessment made by rehabilitation architects. Therefore, Chapter Seven addresses the second part of research objective two, which is to test the second phase of the evaluation tool: to assess architectural rehabilitation interventions and examine the role of cultural significance in the establishment of architectural design strategies for the rehabilitation of historic *liceus*.

Chapter Seven. Rehabilitation Design Principles and Strategies: the Role of Cultural Values

7.1 Introduction

Lawson suggested that 'design solutions are to design what theories are to science: they are the basis upon which design knowledge advances' (Lawson, 2006, p. 122). Therefore, and following the establishment of embedded and documented cultural values of *liceus* in the previous chapter, the aim of this chapter is to address the second stage of Research Objective 3: to understand the role of cultural values in architectural rehabilitation design strategies applied to historic *liceus* recently rehabilitated. Rehabilitation design strategies are conceptualised as the set of best actions established by expert architects, based on experience and evidence, to preserve and enhance significance of cultural heritage values. By finding and analysing the values used in the definition of strategies and principles, the assessment of the architectural design stage will shed some light on what is currently considered most valued to be preserved and enhanced in historic *liceus*, while updating learning and teaching environments, as required by SMP.

The design process in architectural conservation is conceptualised as a sequence of stages based on each architect's methodology to solve problems (methods and strategic knowledge) based on knowledge (in architectural conservation) that is being applied in carrying out architectural rehabilitation. The stages addressed are considered the most influential, in the literature and in current practice, for successful preservation and/or enhancement of cultural values: gathering information and diagnosing the whole situation, establishing strategies to overcome problems (achieved by combining the assessment of reality constraints and the aimed objectives) and generating solutions through the use of design principles.

The assessment of each architect's practice rehabilitation methodology, as informed design strategies and applied conservation principles, is supported by the empirical data gathered from each case study through documents (issued by PE and design proposal drawings, written statements and survey photographs) and semi-structured interviews. Categories of strategies and principles were pre-determined according to current international guidance. Emphasis given to each category indicates a preferred driver for the establishment of a design strategy.

The assessment of professional conservation ethics, philosophy, standards and principles considers the ICOMOS Ethical Commitment Statement (ICOMOS, 2002), which guides ethical conservation practice and sets useful principles for people working in conservation. The document stresses the member's responsibility to act in accordance with the charters and doctrine of ICOMOS, relevant international conventions, and the recommendations of UNESCO. To do so, members are advised to 'maintain, refine and update their knowledge of contemporary conservation philosophy, practice and techniques including relevant legal requirements, where applicable furthering their development' (Article 4 in ICOMOS, 2002).

Findings on the values that were most used to inspire, constrain and/or influence the design strategies are discussed by reflecting on the contextual meanings and their wider implications. Therefore, this chapter assesses and discusses the findings of the analysis of architects' rehabilitation design processes, which include three stages: the gathering of design inputs (section 7.2), the establishment of design strategies (section 7.3) and the official appraisals of the proposals (section 7.4). The participation of stakeholders in the rehabilitation process is discussed (section 7.5), and the ERECS tool is briefly discussed (section 7.6). A summary and brief conclusion ends the chapter.

7.2 Rehabilitation Design Inputs

Before turning to the architect's own design strategies, this section reviews the inputs of rehabilitation interventions. Therefore, this section first assesses architects' expertise in rehabilitation, and secondly, discusses the briefs that describe the education general needs for the provision of modern school facilities in existing *liceu* school buildings, the 'Generic Design Brief' (GDB), and the specific requirements for each *liceu* in the schools 'Specific Design Brief' (SDB). Finally, to understand the perception of existing cultural values, the researcher investigated architects' understanding of historic setting significance.

7.2.1 Professional Knowledge, Experience and Ethics

The SMP considered that historic buildings were to be rehabilitated by selected architects with practice in conservation. It was therefore important to evaluate the professional knowledge, previous experience and developed skills of the selected authors of *liceus* rehabilitation to

understand how it influenced the design. It should be noted that in Portugal, architects generally combine the function of designer with project design team leader and are therefore responsible for coordinating a design team of several experts not just technically but also ethically and culturally.

Architectural rehabilitation implies certain obligations to the cultural significance of a place, to its owners and users, to the conservation profession, and to society as a whole, i.e., to the cultural context in which the cultural asset is located, in which the rehabilitation action is to take place. Official codes of ethics for conservation professionals advise the following general conduct: to have an informed respect for the person who created the historic building, an informed respect for the place authenticity and integrity, and the selection of intervention methods and materials to overcome deficiencies such as physical condition and the obsolescence of functional and spatial layouts for contemporary use need, while not adversely affecting the cultural significance of the place or its future assessment.

Brief research on architects' practice of interventions in buildings from the first half of the twentieth century, or before, found that two had experience in remodeling some isolated or accompanying buildings in historic areas, and one had been mostly working in urban design with one reference to the rehabilitation of historic buildings. No references to interventions in listed buildings were found, except for a reception area in a national monument. Further investigation into their curriculums found that the proportion of conservation work is very low in comparison with new buildings or urban plans. This is despite the fact that, without being directly asked, in the interviews all of the architects briefly mentioned previous experience in conservation works. Arch1 said that a perception of the value of existing buildings as 'strong pre-existences' was more important than making their architecture, 'very affirmative, competing with the existing architecture' – a feeling which had started in a specific intervention (1999-2003):

'If such valuable buildings are here, we don't feel the need to make here our architecture. We don't want to. We have another option. We do an architecture which, particularly in its dimension, does not establish a conflict, a competition relationship [...we make architecture] that fits in harmony, that makes musical chord, even understanding that they are dissonant notes' (Arch1, 2010).

Arch2 mentioned their previous experience in rehabilitation but considered that, being an urban planner, 'the biggest professional experience as an architect took place here...[big architecture projects], the first I did was this' (Arch2, 2011). Finally, the experience of Arch3 (who unfortunately passed away before the interview could be conducted) was mentioned by

his close collaborator who gave the interview, in representation of the practice: 'We have made interventions in other buildings in historic areas, and in things that we will have to change we tried to understand what is the spirit of the thing so we don't change its personality' (Arch3, 2012).

All of these narratives describe occasional projects and do not reflect a systematic workload developed in heritage conservation, which could have accumulated practical knowledge over time. Furthermore, in the description of the works selected by the architects to illustrate their previous experience and ethical considerations, no mention was made of architectural conservation principles, international documents or issuing institutions. However, some principles were expressed, which encapsulate the purposes inscribed in such documents, which will be later discussed.

A brief note on the knowledge gained from the first commission to the second commission to rehabilitate *liceus*: there were some references on lessons learned but more were related to management issues than to design options. It suggests that no reflection was made to transfer skills from the first to the second project. It was further noted that knowledge gained was kept in each practice, therefore not sharing failures or strategies.

Arch1 considered his own memory, as a former student and as part of a family tradition of studying at 1PN, to be a value for the 1PN project, when contrasting the knowledge on both *liceus* by saying: '[in 3DG] we had a greater documentary knowledge and a smaller amount of memory knowledge' (Arch1, 2010). This suggests that there was a misinterpretation on what is meant by knowledge of a place in rehabilitation interventions. Arch1 confused the use of special and unique professional knowledge and experience in conservation with personal knowledge and experience in construction.

In the case of Arch2, the relationship with 2RF is also related to family links, as 'a previous addition was made by my father' (Arch2, 2011). Arch3 described 'the attendance, as a student, and later as a teacher of his wife in that *liceu* (6DM)' (Arch3, 2012). This was also unveiled in the interview with the school director when illustrating the commitment of the architect to this work (6DM-SD, 2011). Personal relationships with the buildings brought an emotional value to the project. This private affinity with the *liceu* buildings was an influential factor for the image of the architect within the school community. It further influenced design decisions, as described by Arch1 on 1PN regarding the options for physical changes in the school, and suggested by Arch3 in 6DM, when placing the word '*liceu*' on the main facade, when such a designation has never been there.

Therefore, it was found that the participants on the whole had a lack of experience in rehabilitation interventions – a requirement established in heritage conservation international documents and in Portuguese legislation regarding listed heritage, waiting to be listed or to intervene in buildings protected by a buffer zone. This finding stressed the need to understand which ethical obligations architects adhered to in their personal professional code of ethics to guide the establishment of conservation strategies and design principles applied in *liceus* rehabilitation.

7.2.2 Needs and Cultural Values

The briefs established by PE and given to the architects describe the general education needs for the provision of modern school facilities in existing *liceus* school buildings, namely by providing guidelines for the design and specific accommodation schedule for each school. The handbook on the education architectural requirements further suggested which cultural values PE considered most.

SMPs Generic Design Brief (GDB)

The SMP Design Handbook was a PE work-in-progress, aimed to incorporate results from interventions along the process. Guidelines had been provided to architects since 2007, and only later were compiled in a unique organised document, the 'Architectural Design Handbook' (Parque Escolar, 2009b). Guidance therefore increased from one intervention phase to the next – a fact confirmed by Arch 3: 'PE started to do design handbooks after Phase 0. 4FL was part of Phase 1. 6DM already had another handbook' (Arch3, 2012).

Considering that the purpose of the architectural interventions was to adapt existing schools, it was surprising to find that, although the term used for the programme was 'modernization' (see Chapter 4), understandingly focusing on the modern learning environments, no other terms related to architectural conservation types of intervention were used in the design guidelines, except for the word 'requalification', used once to refer to infrastructure (Parque Escolar, 2009b, p. 2). This fact suggests the total reliability on the professional knowledge, skills and ethics of the selected conservation architects, and indicates that the concept of adaptation needs to be examined in-depth.

Historic values were recognised by PE in the form of three construction periods, perhaps a simple mechanism to identify which schools would probably require more urgently rehabilitation interventions, or to justify the option assumed to directly commission historic

schools to architects with rehabilitation experience. The school buildings were divided into three groups: 1 - up to the end of the 1930s; 2 - from beginning of the 1940s until the end of the 1960s; and 3 - from 1968 until the present (Parque Escolar, 2009b, p. 3). This categorisation further suggests to which *liceus* PE ascribed a higher age value, i.e., the oldest schools were considered to be the most unique and representative of this building typology for education. This rationalisation explains the inclusion of buildings from the 1930 competition, with such different architectural expressions and construction techniques, in the first group. A brief summary of the values ascribed by PE to historic *liceus* of the first half of the twentieth century is presented in Table 7.1 below according to the periods considered in this research and the categories found in the descriptions.

Timeframe	Eclectic <i>liceus</i>	Modernist <i>liceus</i>	<i>Estado Novo</i> <i>liceus</i>
urban setting	very central sites in Lisbon and Oporto; large-sized plots	central sites; different sized plots	built in district capitals; easily accessible areas; large-sized plots, coincided with the whole urban block
formal models	old monastic college models: single compact building with enclosed courtyards; French <i>lycée</i> model: extended layout occupying part/the whole urban block, one or more courtyards	volumes defined by smooth surfaces and flat roofs; use of the sculptural potential of reinforced concrete	high degree of uniformity : adoption of standard strategies; linear configurations made up of several connected buildings; according to the site's morphology, it has two, three or even four levels
architectural style	Eclectic inspiration influenced by the Parisian Beaux Arts; Art Deco-influenced geometric taste	Modernist	Official idiom of the <i>Estado Novo</i> adopted, applying the 'reinvention' of certain elements of traditional Portuguese architecture; pitched roofs, compositional austerity, opaque facades, lack of decorative detail, except on the main facades (in stone masonry, usually near the main entrance)
functional program and spatial organization	reflects the reform of 1905, based on the project for the 1909 Regulation of school buildings: teaching areas (classrooms): organised along wings; auditorium /projection theatre; laboratories for chemistry, physics, geography and the natural sciences (due to safety precautions, were always at the extreme ends of wings or detached from the main building); areas for physical education; school administration area and library (in a central position)		standard strategies: school administration offices: in an independent central main body, next to the main entrance, with direct access from the outside; classrooms: organised along the wings, according to education cycle, with independent access from the main entrance; drawing rooms and toilets: located next to classrooms; laboratories: located at the extreme ends of wings; library and staff rooms: central; canteen, the <i>Mocidade Portuguesa</i> room and the gym/assembly hall in an individual two levels building, independent access; playgrounds: covered or open air
constructive methods	solid and robust, traditional and progressive building technologies with innovative elements: metal structures, steel beams, cast iron columns and concrete pavements	solid and robust, mixed technologies bearing masonry walls combined with portico structures, concrete slab floors and terraced roofs	high degree of uniformity due to standard strategies; mixed technologies – bearing walls of plastered ordinary stone masonry supporting reinforced concrete floors and staircases; occasionally, floors made of pre-stressed concrete beams and ceramic blocks, with the beams perpendicular to the exterior walls; wooden roof structures; inverted concrete beams to which the roof underlayer was also connected
finishing and cladding materials	n/a	n/a	standard strategies: pavements: solid wood flooring or parquet in the classrooms, hydraulic tiles in the corridors; walls: with mortar or plaster corridors and stairs: hydraulic tile panelling; window frames: in wood or pre-fabricated reinforced concrete elements with single glazing

Table 7.1. Classification and description of secondary schools in Portugal, based on (Parque Escolar, 2009b, p. 3)

Table 7.1 shows how SMP valued existing *liceus* in the design handbook, i.e. the GDB, framed by the following components: urban setting, formal models, architectural style, functional program and spatial organisation, constructive methods, and finally finishing and cladding

materials. This list highlights the historic *liceus* material cultural values, where physical condition was to be found problematic and the functional-spatial layout was found to be inadequate for current education needs. No specific indications were given regarding the outdoor areas or contents, either fixed or loose.

SMPs Specific Design Briefs (SDB)

Turning to the analysis of each case SDB, the following findings shed some light on the education requirements for school spaces. To better compare and contrast the requirements for each *liceu*, the colour scheme used per spaces in the following conceptual model provided by PE (see Figure 7.1) was applied for the identification of types of spaces required (see Table 7.2). This coding was further used in the analytic drawings (in appendices).

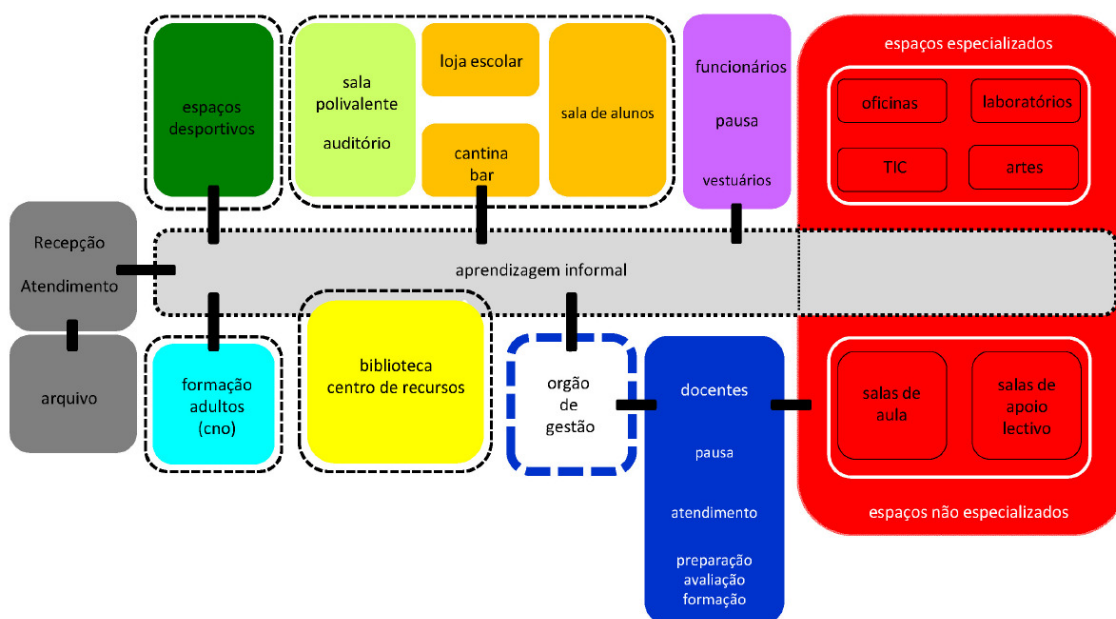


Figure 7.1. 'Diagram of the conceptual model for functional-spatial organisation', in (Parque Escolar, 2009)

Types of Spaces	Case study	Eclectic <i>liceus</i>		Modernist <i>liceus</i>		Estado Novo <i>liceus</i>	
		1PN	2RF	3DG	4FL	5CM	6DM
	SMP phase	1 st	0/Pilot	2 nd	1 st	1 st	2 nd
	Number of Classes (24 to 28 students, single-shift)	42	43	38	37	40	39
Learning	regular classrooms	32	23	28	30	34	30
	ITC classrooms	4	5	5	4	5	3
	sciences laboratories	5	4	5	5	5	6
	arts and technologies	7	5	5	6	5	3
Rooms for visually impaired students		-	V	-	-	-	V
Other Spaces for Education		CEF/EFA	CEF/P	CEF/P	-	P	-
Teachers	workspaces	6	10	'For 33 work-stations'	6	9	'For 40 work-stations'
	meeting rooms	3	3	4	3	3	4
	Common room	1	1	1*	1	1	1*
Staff	Common room	1	1	1	1	1	1
Administration	Direction Board	3	3	3	3	3	3
	Human Resources	5	3	6	5	5	5
psychologist room/medical room		2	2	2	2	2	2
Learning	Library	1	1	1	1	1	1
Resources	Museum Planetarium	-	M	-	P	-	-
Social spaces	Dining hall Cafeteria	1	1	1	1	1	1
	Stationary/shop	1	1	1	1	1	1
Students spaces	Students' Association	1	1	1	1	1	1
	Covered meeting area	1	1	1	1	1	1
Multipurpose room		1	-	1	1	1	1
Sports/Physical education (and inherent changing rooms)		1 (4)	-	1**(\$)	1 (4)	1(4)	1**(\$\$)
Reception/Atrium archives, storage		V	V	V	V	V	V
Parents' Association room		1	1	1	1	1	1
Toilet facilities		V	V	V	V	V	V
Other		V	V	-	-	-	V

Table 7.2. Accommodation Schedules: Specific Design Briefs (SDB) of all Case Studies

Notes on the briefs: (*) 'Observe guiding diagram'. (**) 'Requalification of existing spaces and new facility'. (\$) 'check the needs with the school'. (\$\$) 'Enough to enable 4 classes simultaneously'. (P) Professional Secondary Courses. (CEF) Youth Education and Training courses. (EFA) Adults Education and Training. (V) To comply with requirements/legislation

The briefs established the type and number of spaces needed per school, but no dimensions were given, indicating the adaptation of existing spaces. However, current legislation is very strict and some existing spaces did not comply with these standards. For example, the existing toilet facilities/student ratio was very low compared to current standards. Within some existing buildings, and given the number of classrooms stated in the brief and the available spaces, it became immediately obvious that the SDB was not doable within existing *liceus* buildings.

The definition of specific spaces, as listed in the SDB, does not follow international recommendations which suggest that spaces of education for the 21st century should be flexible (Ponti, 2005) (see Chapter 4) and therefore non-specific to subject areas. This fact might be interpreted as an indicator of an SDB set out for rehabilitation of existing schools. Only on SDBs for SMP Phase Two (cases 3DG, 6DM) were some differences found, such as the use of the word 'requalification' to highlight the values of *liceus'* gymnasiums, and teachers' workspaces being defined by the number of workstations (see previous Table 7.2). All other spaces are left to the architect to decide, which confirms PE's assumption that the decisions made by architects with rehabilitation experience would be the best to preserve the heritage values of historic *liceus*. Nevertheless, PE required heritage appraisals from municipalities and, if listed or waiting to be listed, from the national heritage institution IGESPAR.

7.2.3 Enlightening Rehabilitation

This section investigates Clark's concept of 'informed conservation' which considers that 'without understanding, conservation is blind and meaningless' (Clark, 2001, p. 8). Therefore, and having analysed the guidance provided by PE as part of the SMP, this section now considers architects' experience in historic buildings conservation and the strategies used to understand the values in place.

Brief analysis

The previous analysis on the impossibility of including all requirements of SDB within existing *liceu* buildings was confirmed by Arch1: 'we would like to have had one less floor in here [1PN]. The programs are brutal regarding the quantity of space we had available in these two [1PN, 3DG] *liceus'* (Arch1, 2010). From the comments on the guidance provided and on the Architectural Design Handbook, it was concluded that, although acknowledging their importance, Archs were pragmatic in their approach, not considering best practices or the educational conceptual model provided by PE. In fact, Arch1 'refused' to apply it. Although not

questioning the model, Arch1 opted for their personal way to address problems – a pragmatic approach focused on the 'reality in front of us and the way we could solve it [it's problems] (...) Evidently we care [about the model], but it is what it was possible to do; and that's it!' (Arch1, 2010). This refusal to apply the educational model, well established in SMP Phase 2, was stressed by Arch 1 who recalls that in 'Beja [3DG] there were already a lot of Handbooks. Only now I read them'.

As mentioned in Chapter 3, informed decisions should also be supported on best practices and comparable situations. However, only Arch2 recalls the BSF precedent in the establishment of strategies in the pilot stage of SMP, in 2RF: 'There was an English programme, which was a kind of reference that we had under the theoretical perspective. And then there was a flexible programme, given by Parque Escolar, because [in 2RF] they didn't know very well [what they wanted/needed]. We constructed the programme along the process' (Arch2, 2011). This statement illustrates the lack of importance given to comparable actions.

Gathering of Information

Although it is the owner's duty to provide information about the buildings, in some cases these documents were not provided, or were not provided at the required time, resulting in changes at the design stage and in some cases delays. The importance of reliable sources of information to establish a design methodology was stressed by Arch1, who compared both commissions (1PN and 3DG) by saying that 'the working method was completely different', as while in 3DG access to original documents was initially granted, originating a physical model, in 1PN there was not even a metric survey. Arch1 explained the importance of gathering historic photographs before the design stage, as in 3DG only at the construction stage 'We found the group of photographs from *Mário Novais*, which we didn't have at the beginning (...) Most of the difficult decisions were only taken after we had the photographs' (Arch1, 2010). This statement illustrates the importance of historic photographs for the recognition of the authenticity of the historic material culture values and for the establishment of less significant areas and areas where sacrifices can be made (as described in Chapter 3).

The gathering of information about the historic buildings, their authors and the history of the sites was perceived to be an essential action. All of the architects interviewed emphasised the importance of *liceus* as the work of well-known architects, except in the cases of the *Estado Novo liceus*, whose authors were not known.

Visits to Sites

When asked to describe their first visit to the sites, most architects' descriptions focused on physical problems encountered such as the building conditions, causes of decay and physical constraints. For example, Arch1, describing 1PN, relates the demolition of a significant element:

'There used to be a clear dichotomy between the noisy area and the controlled social area... the core place of the *liceu*, let's say the students room, was demolished and has never been replaced' (Arch1, 2010).

Then it is followed by a description of the problems raised by recent developments:

'Meanwhile serious things have happened.... the most serious of all being that in the last 30 years, the entrance, which had always been here – entering, climbing up the stairs and getting out here - was a sequence of spaces composed by the atrium, the stair case, the wind protection doors, and the arrival patios. And now, for this big arrival, the exterior arrival patios are gone' (Arch1, 2010).

Another example was given by Arch2 who described 2RF as an uncomfortable place 'depressing, mistreated, and unpleasant' (Arch2, 2011) while Arch3 refers to 4FL as being adversely affected by the passing of time due to insufficient maintenance. This problematic approach to historic buildings stresses the idea of architects as problem-solvers, which is in accordance with an established description of design as 'an applied, problem-solving activity generating specific solutions to specific, highly constrained problems' (Snyder, 1984, p. 22).

Considering the principle that a listed building should be respected, and on the other hand that to create a sense of connection and ownership of the school (Sanoff, 2001), students, staff and teacher need to express themselves in the physical environment, it is not surprising to listen to the observation made by Arch3 regarding his first visit to 4FL:

'The building has been appropriated through time; students, teachers and staff have given their small contribution to the school. It is not a "monument building". That could be well observed in the atrium, corridors and classrooms' (Arch3, 2012).

This description of 4FL includes the spaces most shared by the education community. Arch3 also shared the perception that a 'monument is untouchable', and therefore should not be appropriated by its users, who visibly express the social values of the educational community regarding historic *liceus*. The life of buildings after design and production has been considered as 'an ongoing and formative process of consumption (...) a dynamic and creative act that involves the creation and negotiation of meanings and values by different stakeholders' (Maudlin and Vellinga, 2014, p. 1). These changes in/of buildings through appropriation, so

valued in schools (Sanoff, 2001), does not comply with the idea of a protected heritage building, as the listed status is seen to impose restrictions on its use and adaptation. This perspective raises the question if a listed *liceu* can be used today as a school, with its recognised intense and demanding use, where the establishment of a relationship between users and place involve forms of appropriation. By establishing the rehabilitation of historic *liceus*, PE answered the question from an educational perspective. From a heritage perspective, as will be discussed, there was no previous consultation with IGESPAR, the heritage protection institution.

Reports of visits to sites included the description of physical problems along with the existing space constraints in comparison with current building standard requirements, and education requirements, for example the number of students per class. Accordingly, there was a standard ratio of area/student which would be reflected on building standards for schools, for example ventilation. Accessibility was another issue observed as they have at least two levels, and no lift provision. Sanitary installations were in very bad conditions and were too few. Finally, environmental factors such as quality of natural light, acoustics and control of noise, temperature control and air quality were all below current standards for educational buildings.

Finally, the description of the on-site gathering of documentary and evidential data does not refer to information, oral or other, from targeted stakeholders, such as the school community, even though site visits were accompanied by PE, the SD and teachers or members of staff. From the analysis of the architects' gathered information, it can be said that there had been little investment in gathering data to inform the project, perhaps due to the tight timeframes given to design. It suggests that the historic material values of the buildings were linked to the recognition of the original author's professional capacity, as all of the participants recognised authorship value.

7.2.4 Understanding Significance

When asked to describe the places before interventions, at a time when the buildings were 'completely rehabilitated and in use for one year', the Archs did not provide enough information to identify the most relevant cultural values of the *liceus*. Examples of explicit material or immaterial values were rare. Arch1 recognised the social value of the institution *liceu* for the city of Beja (3DG), but did not recognise the architectural value:

'[it] is absolutely central in the city. The *Liceu* de Beja, the "yellow house" is something very important. People have significant pride and love for the *Liceu*... but, when you start to ask

about architecture, “yes, yes, it is important” but they don’t like it. That was never really loved. Perhaps today, I don’t’ (Arch1, 2010).

Generally, the main facade was mentioned only when asking to compare pre- and post-intervention to highlight that it was 'untouched', retaining the authorship value as a contemporary identity element (e.g. 2RF). The general atmosphere inside the *liceus* was reported to be ‘depressing, mistreated, and unpleasant’ (Arch2 on 2RF). Besides references to classrooms, specific spaces of *liceus* were rarely mentioned apart from in 4FL (the space for the projection of *Estado Novo* films) and in 2RF (the library).

Authorship Value

The participants on the whole demonstrated respect for the original architects work in the *liceus*. However, they expressed it differently, according to their objectives. This research found that Arch1 used two methods: buildings were 'personalised' into the original architects, and the original architect’s design philosophy was used to justify their personal approach. Personalising the *liceus* into the original architects was a strategy used to expose Arch1 personal knowledge on the authors' work: 'We, in *Ventura Terra* [*liceu*] feel we are in front of a various serious architect, very interesting, very intelligent, very good (...) you feel inside history beside him' (Arch1, 2010). On the other hand, Arch1 refers to 3DG’s architect differently: 'You feel it in Beja, that creature, you feel a lot the authorship of this thing here [3DG] it is brutal, the environment' (Arch1, 2010). Personal knowledge is referred to as a contributing factor for design: 'from *Ventura Terra* we know not much...from Cristino, he’s a character that is around, he is walking somewhere in there (...) “The Cristino” (...) was a figure in the world of my parents; he was teacher of all of them (...) And, after all, I knew him (...) This thing about Cristino having testimonies, is very strong, because we have testimonies of people who met him' (Arch1, 2010). Finally a comparison was made on their works: 'he [Cristino da Silva] is a formalist, and *Ventura Terra* is no formalist'. By considering that 1PN is a modernist approach, where 'Ventura Terra does not use much words or adjectives, in some way he (...) simply applies what is necessary' and considering that in *Ventura Terra*, 'intelligence rules the form' giving place to a 'fantastic plan and building', Arch1 suggests that an intelligent, minimal and contemporary approach be taken. On the other hand, Cristino is contrasted as being 'mainly formalist', and therefore 3DG is viewed as formalist building thus it requires a formal approach.

In addition, Arch2 also used the authorship value on his design interest, as he said, it was a 'very important argument' against the application of building standards, such as thermal, acoustic and ventilation: 'the fact that there was a building - let's say - with the history behind,

was a good argument for us (...) to [engineers] lower down the standards, to make life easier (...)They [engineers] listened to us carefully' (Arch2, 2011). Referring to the author, this interviewee further mentioned the non-evaluation given by PE to the author of this historic *liceu*: 'to work in a building by *Marques da Silva* (...) was something that they [PE] didn't care much [about], and it was we who suffered, in the good sense, the shock' (Arch2, 2011), confirming the PE option of commissioning historic *liceus* to practices experienced in conservation. However, this argument could not be used in the unlisted 5CM, which was a *Estado Novo liceu*, therefore, designed within the government office, mitigating the architect's authorship value. By saying: 'I could never find a word about the architect, never found his signature'(Arch2, 2011), Arch2 validates the *Estado Novo* objective of nullifying authorship value.

Finally, Arch3 had academic knowledge of 4FL architect's work, referring to the 'nice work from architect Jorge Segurado, which reflects the modern movement style in practice at the time, and easily observed in the layout of the classrooms' (Arch3, 2012) – an identity element of *liceus* that would be preserved in rehabilitation. Regarding 6DM, it was said to have been the architect's wife's school, where she was both a student and a teacher, suggesting a personal link with the place. Therefore, authorship value was used as a tool in the rehabilitation strategies: to support design strategies and to reduce the compliance with building standards.

All photographic surveys taken by Archs on sites revealed their interest in historic contents of *liceus*. Although not explicitly mentioned in the interviews, furniture such as students chairs and desks from different design periods, historic fixtures (e.g., commemorative plaques), historic educational collections, wall inscriptions, commemorative plaques, works of art (e.g. tiles, sculptures, bas-reliefs), blackboards and teachers wooden stands were carefully recorded. Clearly requiring restoration, no reference was found in the design briefs to these heritage objects which are part of *liceus'* cultural significance, as perceived by the Archs.

An analysis of design statements (written at the time of design) provided more data. In summary, what the Archs valued most in historic *liceus* was:

- Urban plot (location, dimensions and outdoor spaces)
- Building (age, author, characteristics such as style, form, spaces layout and access/internal circuits)
- Building fabric (constructive systems and materials, although in a deficient condition)
- Buildings content (furniture, fixtures)

- The building's developments (demolitions and constructions, change of window frames and introduction of blinds, introduction of partitions, use of foundations level, functional adaptation of non-classrooms spaces).

7.3 Established Rehabilitation Design Principles and Strategies

After identifying the perceived core material values of *liceus* and the changes needed, this section discusses the architect's own rehabilitation design principles and strategies used for the rehabilitation of historic *liceus*. The main aim is to find out how far international conservation principles were followed, even if implicitly, and to analyse the values used in the architect's established design principles and the strategies applied to conduct the required physical changes to adapt the historic physical environment to new education needs. Design principles are conceptualised as general changes that ought to be made, according to a specific ethical conduct, to existing cultural material values. The aim of establishing principles is to further translate these principles into design strategies, i.e., physical actions based on previous experience, briefs requirements and gathered evidence, to be conducted on sites specific contexts.

This section is structured according to categories of design principles and strategies most cited by Archs in design statements and interviews. This understanding is most important as physical change of the built environment is an influencing factor in users' general opinions on the success of interventions, which affects the immaterial values of these education environments.

The analysis of working drawings, through the CAD standardisation of layers and lines, and the application of a colour-code related to uses, is a useful tool to identify functional and spatial changes. The understanding of the location of education spaces of each SDB was analysed using the technique of drawing reduction (Leupen et al., 1997), enabling comparison and contrast, within each case, of the functional-spatial layout before and after rehabilitation, and across cases, to find patterns of applied design strategies (see previous Figure 7.1). This assessment further assumes that successful rehabilitation design strategies enable targeted users to change their sensorial experiences of places while retaining *liceus'* historic significance, therefore having an immaterial effect on the schools' cultural values.

7.3.1. Architects' Philosophical Stance

During the interviews, the architects explained how they approached existing buildings and the required programme, i.e., the architectural brief. One of the Arch3 explained that their office had a distinct heritage intervention philosophy, described as follows:

'Our heritage intervention philosophy tries to keep the most of everything that exists, which is from the original [project] and which makes sense in the architectural object, and which are not unjustified additions, and keep, preserve and, whenever possible, restore. [We aimed at] Being conscientious and avoiding that rehabilitation hinders [the] good functionality [of the building]' (Arch3, 2012).

This approach establishes a boundary between rehabilitation and good functioning considering that the first stops when it affects the second. This philosophy clearly established the design principles and the design strategies for the rehabilitation of historic *liceus*. Another Arch explained their rationale for the interventions:

'They [the buildings] have an historic and architectural characteristic, as well as functional characteristics, which we have to respect also. It's part of architecture (...) The criterion is to touch very little or touch only on extreme situations (...) We'll have to enhance things that a qualified colleague did. It does not make sense. He did it this way, it is this way. Except in what is really incompatible with time (...) I think that in the old buildings, the buildings rule the programme, it has to. I think this. The programmes rule less than what it is built. And the specific conditions that the buildings spaces offer are decisive for the location of the equipment and the programmes' (Arch1, 2010).

Although sharing the same idea of preserving as much as possible, this position contrasts with the previous one, as functionality is not a priority. Arch2 did not state his standpoint so directly, although, when asked to comment on the opinion of a 2RF teacher that said that there were no changes in the building, Arch2 said:

'It's good that they say that, isn't it? It keeps the spirit. There are a lot of changes, you just need to see the project. But if they say there has been none, it's good. It means that the spirit of the building was kept – it was one of our objectives. I'm glad with it' (Arch2, 2011).

It expresses the idea of '*genius-loci*' (Norberg-Schulz, 1984), also referred to by Petzet (2009) in the context of monuments and sites. However, Arch2 considered that the average life of a building is 70 or 80 years, and that (the buildings) 'do not fail because of construction issues but because of the programme' (Arch1, 2010), acknowledging developments in ways of life and in building requirements. He continued: 'I think that physically it will break because of the project and not because of construction. But I'm not aware of what the next problem will be so I don't have the capacity to predict. But, as a good planner I am, increasingly, I think less capable of predicting situations' (Arch2, 2011). These thoughts are in line with the idea that

'change is a fundamental issue in school planning - not whether a school will change but how often' (Brown, 2010, p. 57).

Therefore, none of the Arch3's proposals had a specific conceptual idea but all engaged in a problem-solving approach rather than a values-based approach, however attentive to the effects on existing material values. The ideas behind the designs, however, appear to have followed a rehabilitation approach, adapting needs within the existing *liceus* buildings and sites rather than generating a conceptual design approach that would have evolved from the contemporary educational need.

7.3.2 Minimal Intervention in Historic Fabric

The conservation principle of minimum intervention, which considers that the least degree of intervention should be undertaken 'to ensure the retention of tangible and intangible values and the continuation of uses integral to those values', avoiding 'the removal of fabric or the alteration of features and spaces that have cultural heritage value' (ICOMOS New Zealand, 2010) was pursued in *liceu* rehabilitation. The adaptation of existing buildings to current building standards to meet modern requirements required architects' creativity in order to minimise interventions. The challenges were as follows:

Updating Functional-Spatial Layout

In the 4FL Design Statement, Arch3 addresses the spatial organisation considering the new pedagogical programmes, which 'induct and impose new values and factors in the equation: rehabilitate buildings / install pedagogical programmes' (p.2). This perception of the possible incompatibility between both actions was only mentioned by Arch3.

The functional-spatial layout of historic *liceus*, as found in 2007, had already undergone several changes since their original construction (see Chapter 6). It was found that the design principle most generally used in updating the functional-spatial layout was to preserve the most significant spaces in their original locations. Therefore, atriums, classrooms, corridors and staircases, gymnasiums, libraries, administration and administrative rooms, kept their original location. Generally what changed most in terms of the existing functional-spatial layout was the introduction of science laboratories, canteens, sports pavilions, toilet facilities and lifts.

7.3.3 Respect Historic Authenticity and Preserve Integrity

The research found that the four aspects of authenticity suggested by Feilden and Jokilehto (1998) – in design, in materials, in workmanship, and in setting, considering the original creative process and further developments – have been considered differently by different architects. Framed by the Nara Document on Authenticity (UNESCO, 1994), the research found that architects were considered to have changed the historic authentic elements as little as possible, and preserved their integrity. The historic building *liceus*' form and design, location and setting, as well as constructive systems, were generally preserved in all cases. However, an exception must be highlighted in the Arch1 design proposals (1PN and 3DG), which seem to affect setting authenticity as, in the first case, it changes original/existing circulation paths, and therefore the perception of spaces, and in the later, changes the perception of the original building by adding new volumes within the original building, with the same architectural language, as a pastiche.

Generally, materials were changed in pavements, due to wear and tear over time, and ceilings due to the need to provide new lighting and mechanical systems, in buildings designed for the use of natural light and natural ventilation. Generally floors were wooden and were replaced with synthetic materials which are believed to ensure a higher durability. This change brought colour to the floors where previously there was a uniformity of varnished/polished wood. However, PE-BAD personally explained that this recommendation was soon to be abandoned, as synthetic floor coverings are cheap to install but come with a high maintenance price, so they will be returning to 'traditional materials, modular, ceramic or stone' (PE-BAD, 2011), reflecting a 'lesson learned' in this process.

Finally, the use and function was updated, by changing the use of some spaces, but preserving the historic rooms, changing the location of some shared facilities, and opening some links in the historic fabric for the passing of technical ducts, currently required. The Archs' study of the best location for the minimum loss of historic fabric indicates the aim to preserve, and enhance existing spaces, as Arch3 explained in the 4FL design statement: 'even though operational losses were unavoidable'. The overall interventions aimed to update the spirit and feeling of the place to a modern environment while preserving the historic fabric.

7.3.4 Integration of New Fabric in the Historic Context: Construction and Materials

The need for more spaces, expressed in the SDB, led to the need to design the provision of extensions or new additions. Different design principles were taken by architects regarding the

integration of new fabric in the historic context of *liceus*. The respect for history recommends that the unity of the setting be preserved, appealing to perceptual principles of continuity and compatibility in the adaptation to the unique values of each site.

Architects aimed to maintain the visual integrity of the historic building, with a contemporary architectural layer, although respecting the character of the original work. This was achieved differently. Using the historic building profile as a guideline including the massing, window rhythm, scale and proportion, the additions in 1PN, 2RF, 5CM and 6DM present a contemporary architectural expression, except in a linking element in 6DM – a bridge, where the replication of the windows used a design technique applied in former extensions to the building (pastiche).

The design principle of not to affect the overall architectural composition recommends that a symmetrical elevation should not be unbalanced. Arch 1 applied this principle in 1PN but not in 3DG, as the original design concept was already asymmetrical. Interventions in historic fabric are recommended to use materials and detailing that complement the historic building

New Materials

Colour was a design strategy found to be used by all Archs to link past and present. Arch1 applied the same materials found in the historic *liceu* in the new building, but with a new design and a new colour: '[in 1PN] all historic spaces are bi-colour and when you enter the new areas you only have beige, the light colour. It changes the thing without changing too much, but enough (...) We proposed our own palette (...) because of the future, we tried to use RAL colours chart ' (Arch1, 2010). In 3DG, an existing 'ugly green' was kept in all of the doors as a 'way to keep the memory' (idem) – a memory assumed by Arch1 to be in the users minds. On the other hand, Arch2 explained that replacing the wood in the pavements with linoleum led to the decision to use matching colours on the walls of 2RF, different for each floor level: 'I wanted to separate the new from the old'. In 2RF, a former member of the school direction reported:

'Instead of having uniformity, colour (was used) as (in) a hospital (...) it is interesting for the kids' (2RF-ED, 2012). The current direction member further added that 'it is even helpful for those who come here for the first time. Because then we say this is kind of a hotel. Floor -1, floor 0, floor 1. So the classrooms are identified, the first number is always the floor and then we say: "Floor 1 is blue, floor 0 is green", and help people to get oriented. People always think it is too big, and they won't be able to find their way around' (2RF-SD, 2012).

However, 'if it was today, I would be using varnished wood which is much less exhausting and that is what I did later in 5CM' (Arch2, 2011). This option, of varnished wood, was used by

Arch3 in all of the doors, which were all replaced by new doors, in 4FL and in 6DM. In summary, in the design of a contemporary layer, the respect for the existing fabric induced the use of colour as a pattern-design strategy to distinguish existing fabric from new interventions.

Extensions and New Buildings

In 4FL, there was no possibility of adding a new building on site. Arch3 recalled their thoughts: 'It could not grow to the sides because it occupied the plot completely; it couldn't grow up because we didn't want to change the existing building, even though the version that is there is not the original version of the *Liceu*; the only option we had was to "grow down"' (Arch3, 2012). This strategy to extend the existing buildings to the foundations level was also used in OPM, 1PN, 2RF, 3DG and 5CM. Firstly, the requirement of sports pitches on the outdoor areas made the existing space small for sports and for new buildings. Secondly the structural interventions needed for anti-seismic performance required, in many cases, the need to dig until that level. However, this option contrasts with the principle that considers that new buildings should have independent foundations that do not compromise the foundations of the existing building. Perhaps a revision should be made in cases such as that reported.

In 6DM, Arch3 wrote: 'In the new building, adequate solutions to the new function were located, without disguising a constructive truth, assuming it in a confrontation as harmonic as possible, while assuming the contemporary languages, new materials and new constructive systems' (Design Statement, p.4).

The basic rules of using the appropriate scale, compatible materials and suitable location so that the new building does not dominate the historic building or overlay the main facades, was followed by all Arch3s. However, 3DG was a difficult case, as Arch1 stated: "The asymmetrical plan and a 360-degrees view of the *liceu* buildings required the definition of a siting that would affect the skyline of the building as little as possible."

Following the design principle on the adequate siting of new additions, one of the buildings in 3DG was located beside the main facade but in a set-back location, behind the main facade. The new 1PN building was sited in a central position. Built out of concrete, with steel elements, a flat roof, stone staircase and atrium pavement, the contrast with the historic materials in the *liceu* building, which would be restored or replaced, is evident. However, the extension of the existing gymnasium was used as a justification to apply solar protection comprising a corrugated and perforated metallic plate, which extends through the 1950s

gymnasium facade, covering it. The proposed 'unique front' with a 'neutral image' replaced the *Estado Novo* facade, as Arch1 explained:

'Here we are nullifying the building, you can only see it through the inside. When this entered this was a horror. I do not discuss the quality that it is completely inappropriate. We are nullifying this architecture.... on the outside it was green and red just like the national flag' (Arch1, 2010)

This justification seems to indicate that a selected view of the past was taking place, although the original building was left intact.

Enhancing Environmental and Physical Condition

Linked to the changes made to the functional and spatial layout, the enhancement of environment and physical conditions was vital. Under current legislation, this requirement could only be fulfilled by introducing new materials into the existing fabric, which required careful consideration for the definition of 'sacrificed areas' (Appleton, 2003). Each type of function required specific lighting levels, ventilation standards, acoustic levels, thermal control, fire security equipment, accessibility elements, etc. All of these issues were considered in the design proposals, for which the design principle of minimal intervention gave way to a design strategy which emerged as a pattern from the research: the most 'heavy' technical spaces with the most intrusive elements were located in the new additions, moving the special programmes to the new building, as in the case of the gymnasium, conservatory and auditorium in 2RF: 'new buildings to answer to new pedagogical programmes' (Arch2, 2011).

Some could not be moved, such as thermal isolation – an issue with the *Estado Novo* liceus, as they are non-listed buildings. In 5CM, thermal isolation was placed in the interior of the building envelope, so that the architectural expression of the building would be preserved (Arch2, 2011), highlighting that current legislation affects the establishment of design strategies.

Incorporating Contemporary Technical Services

As previously noted by Brand (1997), building services are one of the elements of buildings that are updated on a regular basis. They can also make a significant impact on historic building fabric, on the integrity of interior spaces and on the building envelope. The Archs were aware that some education spaces would require specific technical systems, such as HAVAC or ICT cables, which would require significant sacrifice of areas if located in the historic buildings. For this reason, those spaces were located in the new additions, in all cases. The

route of new services through the existing buildings was established differently according to the architects, and to buildings, and can be summarised in two patterns: visible or hidden.

The following Figures 7.2 and 7.3 illustrate Arch2's description of the technical systems applied in *liceus*. As opposed to the initial pursuit of 'honesty' in 2RF, Arch2 used a different solution in 5CM. In 2RF, the option was to have all of the elements visible in the corridors: 'it was our belief that by doing this, we were changing much less the building, by not using false ceilings and other stuff. At least it was an honest situation, let's put it this way' (Arch2, 2011). However, in 5CM: 'all of the system is on top and descends in a double wall inside the classrooms' (idem), which suggests it's easier to sacrifice the *Estado Novo* fabric than that of the Eclectic *liceus*.



Figure 7.2. 2RF corridor: solution for introducing new buildings systems for ventilation.

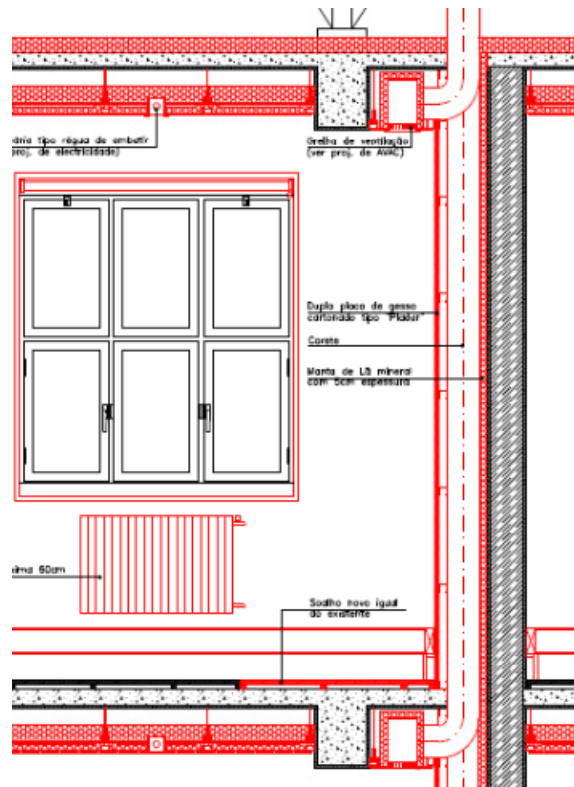


Figure 7.3. 5CM classroom: new ducts for mechanical ventilation. Source: Arch2.

Assure Reversible Interventions

None of the interventions were explicitly designed under this principle. However, in general, if removed, the overall identity of the historic *liceu* could be regained, as most fabric was kept in place and linking elements could be removed with limited loss of fabric.

7.3.5 Considering Socio-Cultural Values

Although all of the actions were targeted at users, the Archs' strategies were not directly focused on the users' reactions to the new sensorial experiences that were being planned for the rehabilitated *liceus*. The process of becoming aware of the new physical spaces, in regard to the historical buildings, was only changed in one case where a space, which is a significant part of the *liceu's* elements, was replaced to improve the students' experience of the school. Arch1 proposed a new building for 1PN's main entrance. With this design, The old atrium and the old central staircase of the *liceu* are no longer obliged to [suffer] intense daily use, but [are] used only in commemoration events of the school life' (Arch1, 2010). Reflecting on this proposal, it suggests starting an architectural heritage patrimonialisation process in 1PN, changing the nature of the building space, its context, its use, its meaning. It was the only

example found in the six cases, and a case to be further explored as the change in the interaction between the users and the building introduces changes in the affective memories of the place.

This simple example illustrates how change in material cultural values can change a sense of continuity, as it has been transmitted from fathers to sons, which may affect the sense of community as the shared meanings will be different if the values associated with the heritage change. It is believed that the collective esteem felt for the historic place might be enhanced, as the physical condition was enhanced and the image for the public realm has been improved. However, it would seem that the sense of place, so enthusiastically felt by Arch1, might change with these interventions, as the physical identity of the space changed.

7.4 Heritage Appraisals

Built heritage rehabilitation relies heavily on architectural rehabilitation strategies, which are usually established by architects, framed by national and local building and heritage legislation, and by state consultative or advisory institutions, national (Ministry of Culture, IGESPAR) and local (municipality), to oversee legal and heritage policy issues in the design stage of the decision-making process. Beside national and local legal tools, rehabilitation interventions are supported on international guidelines, recommendations and charters (Pickard, 2001: p. 4).

The fact that some historic *liceus* were listed affected the design strategies. In some cases, heritage listing was seen as a constraint when considering extending a building. For example, Arch3 reported:

‘4FL had constraints, it could have been listed. It could not grow on the site because it occupied the plot completely; it couldn't grow up because we didn't want to change the existing building, even though the version that is there is not the original version of the *Liceu*. The only option we had was to “grow down”’ (Arch3, 2012).

Comparing a listed *liceu* with an unlisted one, Arch2 stated: ‘In 2RF, I am constrained [restricting ideas]; in 5CM I’m playing at ease’ (Arch2, 2011), reflecting that he considered buildings from the 1920s differently than those from the *Estado Novo* period, valuing the former more than the latter. It was therefore important to understand how heritage appraisals considered the historic *liceus* and the proposed changes. Besides the assessment of the education brief fulfilment by PE, devices for controlling architectural quality were used at SMP,

such as the fulfilment of general building legislation on construction and on buildings for education requirements (assessed at municipalities planning permission) and, in the case of the listed *liceus*, the fulfilment of heritage legislation (assessed by regional or national heritage officers at IGESPAR). PE, being ran in an exceptional regime, submitted the projects to both entities, even though it was not legally necessary, as Arch1 pointed out: 'The Law only requires the municipalities 'previous and non-compulsory appraisal', however, state works never go to municipalities' (Arch1, 2010). If the aim was to get experts' constructive comments to enhance proposals, this was not the case, as the 3DG appraisal only shows a number of flattering comments on the proposal. The following sections discuss both appraisals, starting with the listed *liceus*.

7.4.1 Official Heritage Appraisals

The appraisals reveal different attitudes. Considering that, as 'the study was sent in an advanced development stage, it is extemporaneous the appraisal of the options that would have been in the study origin', OPM's appraisal document summarises the interventions and concludes that 'from the analysis of the sent elements, there are no objections regarding the heritage perspective'. Three months later, the 4FL project was submitted in the same development stage and the same officer wrote that the intervention favoured 'an internal reorganisation of the spaces and functions and tries to respect the original spaces and materials the most', further adding:

'Although the study has been sent in an advanced stage of development, making the evaluation of options on which the proposal was supported to be extemporaneous, it has been considered - knowing the constraints imposed by the existing buildings and by their implantation area - that the interventions respond well to the refurbishment objectives. The analysis of the elements sent does not therefore result in any objections from a heritage point of view, so it is considered that the study should be approved' (Information n.o 79/DS/DSPA/2008; 2 September).

The following projects seem to have been submitted in due time. The appraisal of 2RF considers the intervention 'suitable' regarding the relationship with new added buildings, the approach taken towards required adaptations and modifications and the consideration for the existing qualities and problems. By considering that the project should be approved, the officer further stresses: 'not just due to the fact that it does not raise objections of heritage nature but also due to the value of the intervention in itself' (Information 23/DS/DSPA/2008; 3 March). However, attention should be given to a comment evaluating the response of the new

created building to the programme needs, as this is out of their competencies. Only five days later, the same officer assessed 1PN project, considering:

'A suitable conjunction of the new work with the refurbishment work: in the functional and constructive enhancements, in considering the proposed volumetry, in the choices to use or keep materials, in the creation of accessibility and articulation with the neighbour School *Machado de Castro*. According to the inherent qualities of the intervention, and therefore for its harmonic integration with the existing heritage value, it is considered that the study should be approved' (Information 25/DS/DSPA/2008; 11 March).

Theoretical criteria were used by another officer to evaluate the 3DG project and to explain the proposed changes to an exemplar architectural work of the Portuguese Modern Movement discourse:

'The change in the building 'mole' [massive construction] is the most sensitive aspect of the project, for which superior attention is called to this issue. Therefore, we consider that, in addition to the highly meritorious program, the project do not endanger the existing heritage values, due to the knowledge, respect and rigour shown in the project, for it is considered that the study should be approved' (Information 36/DS-DSPA/2009; 16 April).

Although evaluating SMP as 'meritorious', and considering that 3DG heritage values are not endangered, the officer called for superior attention to the impact of the proposed change.

Analysis of the national appraisal documents, issued by IGESPAR, revealed a lack of critical analysis of the projects. In 1PN, what was most valued was the intrinsic value of the proposal and the harmonic integration of new work in existing values, enhancing the functional and constructive values by preserving existing materials and by the proposed new volumes and new materials. In 2RF, the new buildings were considered to establish a suitable relationship with the existing buildings and the urban environment. In the case of 3DG, the heritage official expressed some concerns regarding the impact of the proposal on the architectural value from the modernism period, expressed in the existing mass and volume of the historic building. However, and considering that the project 'demonstrates knowledge, respect and rigour', its approval was proposed. Finally, in 4FL, the assessment focused on the refurbishment objectives and not on evaluating the safeguarding of existing heritage values. As discussed in Chapter 3, an attitude of 'tolerance for change' (Araoz, 2009) was unveiled in the note on the physical constraints of the project, suggesting some acceptance for the proposed alterations, as well as the fact that the project was submitted during construction, which suggests that the heritage appraisal would not make any difference.

Interestingly, after these assessments and construction approvals were completed, an article in a national newspaper *Público* (Viana, 2009) revealed that the IGESPAR had concerns

regarding the safeguarding of historic *liceus*. The Director of IGESPAR's Heritage Safeguard Department considered that the new education programmes would be able 'to maintain many of the characteristics' of historic *Liceus*, which suggests that values would be lost in these interventions which had already been approved by IGESPAR. However, the article continues by saying that 'overall, the IGESPAR gave advice and is monitoring about 100 projects - which is required by law, because they are schools under the process of classification or which are included in a special protection area'. As previously explained the exception regime exempted IGESPAR from appraisal, even though PE required their opinion. Therefore the worries on the 'disappearance of school architecture' seem to rely on the fact that, according to the article, 1PN, 2RF and 4FL projects had been submitted to IGESPAR for approval after construction had started. However, by the date of the article, 0PM, 1PN, 3DG and 4FL were under construction, 2RF had already been inaugurated and soon after, its listing proposal would be closed.

In summary, heritage officials' assessment criteria for the evaluation of the architectural rehabilitation of historic *liceus* are unclear. The results of heritage impact assessments are synthesized in short records where some minor references were made to the impact of changes. Therefore, it is not perceived which heritage values of historic *liceus* were considered most significant to be preserved by IGESPAR. Based on these reports, all of the proposals were approved, suggesting that no negative impacts would result from the proposed interventions. Hence, the heritage appraisals had no impact on the design proposals.

7.4.2 Municipalities Appraisals

Local planning authorities – municipalities – only had to be informed of interventions, using the figure of 'pre-application stage'. However, in Lisbon and Beja, three appraisals of *liceu* rehabilitation projects were issued. Questioned if any other appraisals had been issued, Arch2 and Arch3 did not recall. Although the findings are therefore limited to the analysis of three cases, the following Table 7.3 strongly suggests that local authorities consider heritage values to be embedded in existing fabric which, the appraisals underlined, should be preserved.

Values of original building	historic	architectural	aesthetic	constructive	environment	spatial and functional concept	form	main facade
OPM		X	X	X	X			
1PN		X	X	X		X		
3DG	X	X		X			X	X

Table 7.3. Heritage values, in Municipality heritage appraisals.

Municipality heritage appraisals acknowledge the architectural and constructive value in all cases, while some values are more evident than in others, such as the value of spatial and functional layout used in 1PN, the roof form and the windows original design in the main facade in 3DG. Considering Arch1 projects, in 1PN the municipality drew attention to 'the resulting morphology, [which] changes the spatial and functional concept of the original project', while in 3DG the project was considered to show:

'Remarkable prudence and secure understanding of the essential values to preserve in this "old" building from 1936' where 'the addition of the construction area, through new buildings (...) was made with remarkable form restriction and splendid sense of implantation. It should be further admired, and for now, three design decisions: 1. remove car parking from entrance, clearly dignifying the main facade of the school, which is kept unchangeable; 2. demolition of the pitched roof... and reposition of the original roof in terrace'; 3. replacement of all aluminium window frames... by frames in painted wood, bringing back the original design'.

These types of appraisals do not inform the project and suggest a lack of expert knowledge in the heritage assessments at local levels.

7.5 Stakeholders' Participation

This section discusses the participation of owners and users regarding the rehabilitation design proposals and their impact on historic *liceus'* cultural values, at the design stage.

7.5.1 Owner's Appraisals of Design Proposals

The architects' option of locating additions towards the rear of historic *liceus* to make them invisible from the public realm constitutes an advantageous option with regard to the potential impact on the public image of the building, and therefore on the townscape value of the historic institution. The potential negative impact of siting additions 'in all historic *liceus*' (PE-BAD, 2011) was perceived by most architects. As no intervention was planned for the main facade, the unique historic character and identity, as perceived from the public realm, was preserved.

However, this fact contradicts one of the PE strategies 'to improve empathy with the school' by rejecting 'the traditional 'institutional character' of the school building and the adoption of architecture appealing to the aesthetic preferences of young people' (Heitor, 2008a, p. 27). Although the 'institutional character' of the historic *liceu* is still cherished by its users, the place still carries an historical symbolic message of an elitist education, as the acrostics revealed. PE aimed to 'preserve the facade, to be proud, to say "here is our learning space, my school is here, which is named D. Leonor, or Filipa, or whatever", meaning that the presence of the school space in the urban fabric is also very important to value the school' (ME, 2012). In opposition to the *Estado Novo* period, or the massive period of school architecture at the end of the twentieth century, what is valued in this present context is the historic value in place, and SMP was not used as an opportunity to standardise the image of schools: each case is a separate case.

PE-BAD approached the issue of facades as identity when dealing with 4FL. Its window frames did not comply with environmental or comfort requirements and needed to be replaced. Even though the building was waiting to be listed, ARCH3 searched for technical and aesthetic solutions. The option chosen, and accepted by IGESPAR, was completely different in design, materials and transparency. PE-BAD described this fact as follows: 'the identifying element was gone in favour of the energy efficiency of the building, and the performance of the windows – one of the most sophisticated there is' (PE-BAD, 2011). They continued: 'how far can you rehabilitate an element, if the problem is between comfort and identity?' In this case, PE-BAD has demonstrated a complete 'tolerance for change' (Araoz, 2009) by opting for comfort over preservation.

7.5.2 Participation and Users' Appraisals of Design Proposals

Considering that 'architecture is a profession in the public interest' (Ordem dos Arquitectos, 2001), it should be inclusive of stakeholders' opinions in design decisions. However, there is no culture of participation in Portugal, perhaps as an outcome of the long dictatorship period which ended in 1974. In SMP, the projects were to be presented by PE and the Archs to the school community and the local community. The example of 3DG is paradigmatic as it was a meeting with a full room and the plastic model of the proposal; Arch1 reported:

'An architect stood up and said "My project was better than yours. My project was to build a huge building here" (...) It was a teacher in the school (...) So we packed up our stuff and left the room. We could no longer maintain a dialogue. And we were never called again. And PE never got the courage to ask us to go there again... the Director explained that the teacher wanted more classrooms because they wanted to have only one shift in the morning' (Arch1, 2010).

This event illustrates the difficulty in promoting fruitful participation in SMP. In 5CM, Arch2 reported significant participation from teachers and the school board, further mentioning the Parents Association's actions 'to keep and enhance the kitsch tiles of the library' (Arch2, 2011). Reported as a positive sign of participation, it was diminished by expressing that they were protecting 'kitsch' elements, not genuine.

In SMP, the idea that decisions were made top-down was clearly expressed by users. In the case of teachers, the justifications given for not having participated in the rehabilitation process (Q19.1D) have been made clear: 'decisions are made top-down' [4FL|D13]; 'teachers no longer have any power to decide' [1PN|D07]; 'I don't believe it would make a difference: all was decided' [5CM|D14]. Some participants suggested that 'knowledge of use' would have been a positive contribute for the benefit of design proposals: 'I should have participated in the choice of laboratory equipment and their layout' [6DM|D07]; 'being part of the visual arts group, it should have been a requirement to be consulted during the process, which did not happen' [4FL|D10]. The feeling of exclusion and segregation, i.e. a non-inclusive process, is also expressed in the answer 'only "some" had that access' [1RF|D11]. One participant considered that the reason for not having participated in the decisions was due to a 'lack of interest from the rehabilitation promoters and/or their lack of time' [3DG|D14], which recognises the time required to involve stakeholders in design decision-making processes.

Beside the group of teachers interviewed, the staff survey questions on participation (Q17.1F) also revealed that this group felt that their knowledge of the day-to-day use of the building was not considered important and only technical knowledge was relevant: 'because I'm not an

engineer or an architect' [5CM|F09]. However, this awareness was expressed by other participants from the same *liceu*: 'we were forgotten even though we have more experience in how certain sectors work' [5CM|F11] and in another *liceu* 'we were not called to give opinions, not even about our working place which would have been useful because the space was not suitable to be used by us (administrative services)' [1PN|F14]. The idea of top-down decisions is also clear: 'because I am just a member of staff, and we did not participate because of that' [5CM|F12], and 'staff do not have any participation in decisions regarding the school' [3DG|F11]. Among the staff group, a participant considered that 'neither staff nor the direction board participated in decisions' [3DG|F15], which was denied by the school director in the interview.

On conflicting participation, Arch 1 states: 'Do you know with whom we had the biggest conflicts, in one case and on the other one? With the school architects, with the teachers that are [trained as] architects. The drawing classes teachers. As much in Lisbon as in Beja. They would just say bad things about it, you know?' (Arch1, 2010). Therefore, critics among the professional community were unveiled, as teachers had strong ideas on what changes should be done and were not heard. In 1PN, this critical approach was noticeable in the research questionnaires.

Local community participation was only referred to once on the issue of the change of window frames in 4FL: 'a proposal was presented to the community and it was a muddle: everything was discussed except the building...it was a meeting to debate political ideas' (Arch3, 2012). This description illustrates the lack of practice of local participation in public debates on architectural issues. However, it seems that that was not considered a constraint to the design as Arch3 suggested that they could interpret users' needs and perceptions by 'wearing different hats' while designing, and therefore suggesting that they needed no participation. For example, in 4FL, he describes:

'We tried to design as a user. The maintenance: where will the bucket [to wash the floors] be filled? Where will it be dumped? Where will the broom be kept? These questions never show up on the briefs. Rarely briefs speak about these issues of daily use of the building. We tried to give our contribution, (to) look at the project and see how the kids will use that' (Arch3, 2012).

According to UIA, architects should exercise 'care to the communities they serve. This duty prevails over their personal interest and the interests of their clients' (2011, p. 2). In this study, as explained, a personal relationship was found between architects and the *liceu* buildings. Rather than taking on board the suggestions of users, the interviews unveiled a very personal attitude towards the buildings. In one case, with such 'personal programmes' (Arch1, 2010),

prevailing without assessing others interests, Arch1 explained that there were two design motivations: first the owners' brief which 'requests to "arrange it and place here the libraries, laboratories and ICT"', and there was *my programme*, our programme, a personal programme which was "we are going to rescue this" (Arch1, 2010). This ethical position assumes to know what is best for users. As a result, 1PN's historical staircase was 'preserved for special events', which is interpreted by the researcher as a patrimonialisation of an identity element of the school building, the use of which is being limited to special occasions, depriving students from the experience of arriving at the outdoor patios as had been the case for 100 years.

Although this research is not focused on participation, it acknowledges that one way to capture peoples' values is through participation, as explained by PE: 'participation was done under a climate of great mistrust on behalf of schools. It should be noticed that there is a lack of tradition, and then also because this lack of tradition also meant the absence of pre-tested methodologies that could guarantee the success of the initiative. Therefore, this participation was tested gradually and a model developed' (PE-DD, 2012). However, participation raises some problems. As discussed in Chapter 2, people change, and so do ideas and opinions.

7.6. ERECS Tool: Rehabilitation Principles and Design Strategies

The second stage of the conceptual framework ERECS was used to assess the design stage of the architectural rehabilitation of historic *liceus*, in order to examine the role of cultural values in the establishment of design strategies. In this stage, framed by the theoretical strategies established in the literature review (Chapter Three), ERECS proposes to gather evidence in interviews and in the architectural and content analysis of rehabilitation project. A new category of value emerged from the architect's interviews and assessment of design processes: the instrumental values leading to their inclusion in the framework. The framework was adapted to the following structure (see Table 6.8).

Categories of Values in Rehabilitation of Architectural Heritage	
(sources)	
Evidential Values (embedded in fabric)	urban (site), architectural (building), function (contents)
Experienced Values (sensed by communities)	contemporary (targeted stakeholders' groups)
Recognised Values (documented in legal protection)	historical (heritage records, historic texts and documents)
Instrumental Values (used in design strategies)	historical (authorship), age (fabric), contemporary (brief)

Table 7.4. Conceptual Framework of Rehabilitation of Architectural Heritage

7.6.1 Assessing Design Strategies

The tool was effective in the assessment of design strategies as the architectural analysis enabled an understanding of the main options regarding the spaces, which are most related to the history of education, and to the elements linked to architectural history. The methods further enabled the researcher to understand strategies of designing in a historic context and how to extend an historic building. Finally, the interviews were essential for the understanding of each architect's ethics, personal professional path, motivation and interest in these interventions – understanding not just who is using architectural heritage and how, but also who is establishing the future of the historic environment, as an area of research, and of personal reflective thinking, which needs to be developed. ERECS can contribute to this need.

7.6.2 Reflective Thoughts

In architectural practice, the ERECS tool was found to be effective in retrospectively assessing the design stage of a rehabilitation project, and understanding the role of the heritage values recognised in each historic *liceu*. By supporting design strategies concerning those values, the architects are contributing for the user's experience of an historic environment that have been updated to contemporary well-being and use requirements. Testing the tool with reference to three interviews and six historic *liceus* enabled the researcher to establish patterns of strategies shared in the rehabilitation of this building typology, of which the preservation of

the original view from the public realm was the most valued by the decision makers – Arch, PE and SD – as it was selected for the virtual photograph in the interview to express the key changes post-intervention. As the research found that heritage values were mainly used to justify the design options taken, a revised framework included a new category of heritage values: 'instrumental'. This framework will facilitate the comparison of architectural rehabilitation results, to be conducted in Chapter Eight.

7.7 Chapter Summary and Conclusions

This chapter found that in the rehabilitation design of *liceus*, cultural values were used to justify design decisions. Even though architects were performing the same type of work under the same client requirements and conditions, as the researcher also did, the research found differences between the practices' methods to inform design, to guide design and to establish tailored design strategies for each *liceu*. On the basis of the evidence gathered and data analysis, commonalities were found in the strategies generally employed by architects where the problem-driven approach was generally used, and cultural values were used as instrumental values to justify action, i.e., to validate the rehabilitation design strategies applied. The first finding is in line with Kruger and Cross' (2006) research findings. However, the fact that heritage institutions did not inform the proposals with their own expert inputs, as should be expected, revealed a lack of interest by the state regarding the preservation of historic *liceus*' values, therefore not fulfilling its duty.

The SMP strategy did not provide detailed information on the values of *liceus*. This required the architects' interpretation of sites' values and problems to be addressed regarding their physical condition, heritage values and the educational brief to be implemented. It seems that the tight period given for the design stage mitigated opportunities to explore alternative solutions, suitably backed by architectural, social and historical data, as recommended by international rehabilitation principles and guidelines. Furthermore, as the information on the physical condition of the *liceus* and the architectural surveys of *liceus* were made purposefully for these interventions, reports and documents were sometimes provided after the main decisions had been taken, which affected either the design stage either the design implementation on site. A summary of the key findings is now provided.

Understanding rehabilitation design inputs is essential in the assessment of outputs/outcomes. Firstly, Archs working in historic *liceus* did not have any expertise in rehabilitation. Secondly PE design briefs are focused on enhancing and changing secondary schools' material values to adapt to change, and shift the current paradigm from the traditional school to the new concept of learning environments. Although acknowledging differences, the briefs do not distinguish objectives according to the age of the school or its heritage significance, relying on architects' professional ethics. Thirdly, one important finding: *liceus*, as works created by former architects, are highly valued. Architects' names and qualities were all mentioned, except for the colleagues from the *Estado Novo* period, whose names were not even known. Finally, the architects' assessment of existing cultural values focused on documentary search and site visits, for which values were found in the historic setting, although they had no contact with the target community, except for the SDs. The next section turns to Archs' own design strategies.

The research found that Arch1 and Arch2 followed a problem-solving approach based on their personal practice, and Arch3 did the same, although previous practice in rehabilitation emerged through the mention of conservation design principles and the acknowledgement of the international doctrine. UNESCO conventions and recommendations, or ICOMOS or CoE Charters, regulations and guidelines were mentioned. The established strategies' principles were based on a problem-solving approach rather than a values-based approach. The ideas behind the design appear to have followed a rehabilitation approach by adapting the existing buildings, rather than a conceptual design approach to modern school and modern education, as established in the design guidelines.

It was further found that architectural rehabilitation strategies applied in historic *liceus* were material-based and not values-based, with a diffuse role of cultural values in the establishment of design. The applied strategies for change, although considered to have been respectful regarding cultural heritage, were focused on material values, i.e., on enhancing the physical aspects of *liceus* and the outputs of rehabilitation. By not considering the effects on users, i.e. the outcomes, as the focus of rehabilitation it is missing the acknowledgement of one of the most relevant elements for the sustainability of architectural heritage: people. The next section turns to the design appraisals by heritage experts to assess which impacts were predicted.

Heritage officials' project appraisals use unclear assessment criteria, with the impacts of proposals on heritage values being rarely described, except for some minor references to the

impact of additions. Therefore, it is not clear which heritage values of historic *liceus* were considered most significant to be preserved. Based on these reports, all proposals were approved, suggesting that no negative impacts would result from the proposed interventions. Cross-referencing this information with the interview data, it is now clear why the heritage appraisals had no impact on the design strategies: the documents did not include effective heritage impact assessments, demonstrating the level of interest of heritage authorities for the rehabilitation projects.

Finally, it can be concluded that SMP was not a participative project, therefore design proposals were not inclusive of users' values. This can partially be explained with Portugal's lack of practice in involving stakeholders' opinions in decision-making, as PE-DD suggests, but also indicates how architects do not value users' knowledge, which is considered to be relevant for the sustainability of built heritage (see Chapter 3).

In conclusion, this chapter discussed the contribution of architectural rehabilitation, as a cultural and creative design process, for the sustainability of historic *liceus*' cultural values. The cultural values displayed and sensed in the end products of architectural rehabilitation are addressed in the next chapter, as physical results (outputs), and immaterial effects (outcomes) as well as the relationships of the school community with the rehabilitated place. The chapter will establish the values that have remained post-rehabilitation, new added values, those that have changed, those that were enhanced and those that were mitigated or lost.

Chapter Eight. Short-term Effects of Rehabilitation on the Cultural Values of Historic *Liceus*

8.1. Introduction

The purpose of this chapter is to re-focus on cultural significance and evaluate the short-term effects of architectural rehabilitation on the cultural significance of historic *liceus* at a post-construction stage, addressing Research Objective 3C. By applying the third phase of the evaluation tool ERECS, one year after architectural rehabilitation interventions, short-term outputs and outcomes of the implementation of design strategies will be established. Considering 'output' to be the physical result of interventions on historic *liceus*, and 'outcome' the effect of such results on users' perceptions towards the changed places attributes, the assumption that architectural rehabilitation preserved and enhanced the cultural values of historic *liceus* will be assessed.

As previously explained (see Chapter Five), the dominant research design in this study is qualitative although using multiple approaches, multiple sources of evidence and gathering multiple types of data. However, establishing the effects of an action requires deeper analysis by comparing current values with the original values, as reported in Chapter Six. It is argued that the three established categories of historic *liceu* values – historic value per se, material cultural values, and immaterial cultural values – were affected by rehabilitation. This chapter will evaluate the changes in these categories and in the categories' attributes. Section 8.2 evaluates the physical changes in historic *liceus*' material values, followed by section 8.3 which assesses changes in socio-cultural values as experienced and described by stakeholders. Section 8.4 discusses the recognition of the value of rehabilitation design by the heritage community and section 8.5 revisits the ERECS tool to reflect on the framework's effectiveness. Section 8.5 concludes the chapter.

8.2. Historic *Liceus*' Rehabilitation Outputs

This section briefly summarises the actual physical changes made to the *liceu* setting, building and contents through rehabilitation under the SMP, with the aim of establishing the material cultural significance of rehabilitated historic *liceus*.

8.2.1. Current Setting

According to the conceptual framework established in Chapter Six, setting is considered to be composed of two main attributes, townscape and landscape. The effects of rehabilitation in the townscape were beneficial. The view from the public realm was preserved, and the physical image of decline previously offered to the city was replaced by preserved period gates and fences, surrounding a renewed garden with new pavements and new trees replacing the sick and dead ones and enabling a better view of the *liceus* outdoor areas. The buildings display clean and newly painted facades, which preserve the original design. The observable changes from the public realm were found in the window frames (mostly in 4FL) and in new sun-shade features (1PN, 3DG). The facade colours were preserved, the stones were cleaned, and the names on the facades were preserved (1PN, 2RF, 3DG), replaced (4FL) or added (6DM). No additions are visible from the main facade, except in 3DG where the 360° visibility made it impossible not to see the changes. The removal of the cars from the main facades enhanced the public view of the historic buildings. Arch2 in 2RF referred to the redesigning of the public walkway (see Figure 8.1) as a good design outcome, solving problems with a planning solution and not an architectural one, therefore emphasising the townscape value – an understandable option given Arch2's background in urban planning.



Figure 8.1. Case 2RF by Arch2: before (2007) and after rehabilitation (2011). Source: PE.




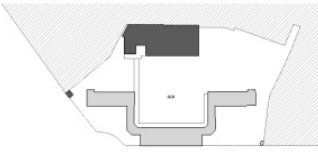
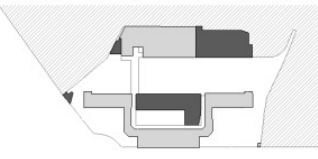
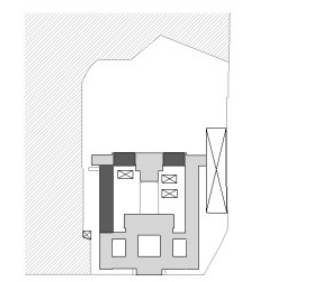
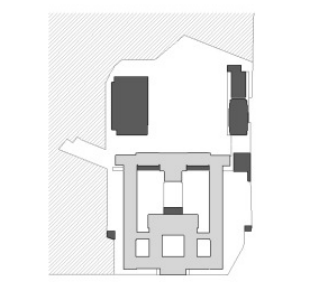
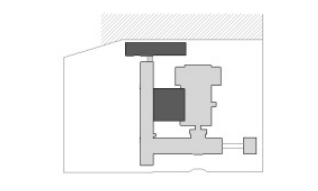
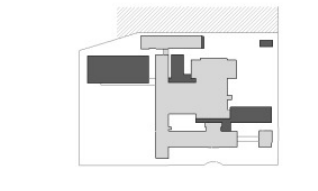
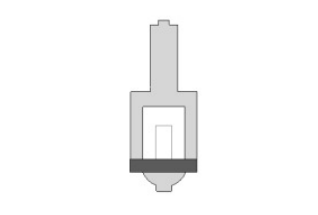
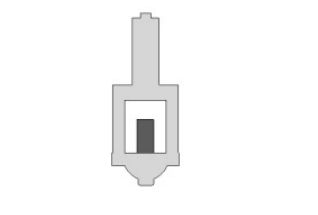
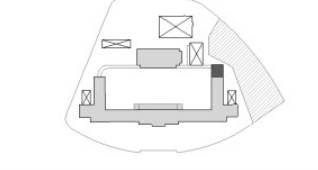
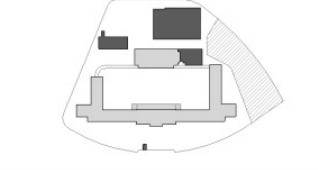
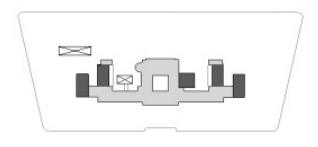
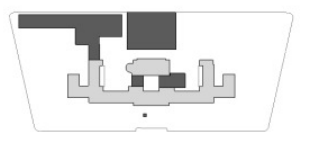
Historic period	code	location	SURVEY, 2007 Provisional Pavilions  Additions 	REHABILITATION, 2010 Additions 
Monarchy and First Republic, until 1928 Eclectic Style	1PN	Lisbon		
	2RF	Oporto		
Dictatorship , 1930's competitions Modernist Style	3DG	Beja		
	4FL	Lisbon		
Estado Novo '1938 Plan' New State Style	5CM	Oporto		
	6DM	Coimbra		

Table 8.1. Additions and extensions to *Liceus*: before (2007) and after rehabilitation interventions (2011).

Contributing to the preservation of the townscape value (Cullen, 1961), historic *liceus'* enclosure elements, such as walls and fences, were seen to be preserved. Arch1 stated that in

3DG, for security reasons, a request was made to place high fences around the site, on top of the original lower walls, which Arch1 did not accept:

'We said we would not do it (...) this building lived with the door open up to this day. And so we explained that if they wanted security they would have to find another way, without 'barbed wire' around the site. It cannot be. I mean, a building that is friendly toward the city, it is not like a school lost in the middle of the country. It cannot be. And then they realised... I do not know how they are going to do it' (Arch1, 2010).

This statement highlights firstly the importance given by Arch1 to the physical and visual relationship of the *liceu* with the community; secondly it illustrates the power that Arch1 had in decision-making during construction, and thirdly it shows that Arch1 is aware that there is an unsolved problem, which is no longer under his control. This indicates a loss of decision power, and suggests that after the completion of the construction, Arch1 was no longer capable of 'protecting' the integrity and authenticity of the historic *liceu*. This last interpretation reveals the limits of what can be asked of architects and of architecture: after construction, it is out of their power and, experience says, architects are very rarely required for any further decisions.

The analysis of the landscape in 2011 found some patterns of design solutions in all of the rehabilitated cases. The original plot shape and main entrance were kept (except for 1PN), and vehicles were confined to designed parking areas and traffic paths, with controlled access. Small lakes or fountains with animals (frogs, ducks or fishes) originally located in courtyards (2RF, 3DG), were removed, as well as original drinking fountains (e.g., 3DG inside the building, in the corridors). Most of the additional gross area is occupied by new sports pavilions, which added with the outdoor area ascribed to sports pitches shows the current importance that education gives to physical activity in secondary education. This value was further acknowledged in the questionnaire, with responses from teachers and staff identifying 'sports' as one of the school's new added values.

measuring change		area				
		Buildings total gross area (m ²)	Footprint (m ²)	Buildings % of plot	Additional area in underground (m ²)	Site area (m ²)
0PM	SURVEY, 2007	11795	4020	25%		16000
	REHABILITATION, 2011	16445	7060	44%		16195
	difference	139%	176%	18%		1%
1PN	SURVEY, 2007	10710	4340	23%		18910
	REHABILITATION, 2011	17055	6765	37%	1475	18450
	difference	159%	156%	14%		-2%
2RF	SURVEY, 2007	17485	6120	22%		28115
	REHABILITATION, 2011 (+ Music Conservatory)	15060 (+8060)	7130 (+3410)	37%	3625	28115
	difference	132%	172%	16%		0%
3DG	SURVEY, 2007	13410	5950	25%		23460
	REHABILITATION, 2011	19835	8595	37%	575	23460
	difference	148%	144%	11%		0%
4FL	SURVEY, 2007	12425	4855	70%		6940
	REHABILITATION, 2011	15965	5155	74%	3190	6940
	difference	128%	106%	4%		0%
5CM	SURVEY, 2007	9435	3350	18%		18850
	REHABILITATION, 2011	13595	5090	27%	1815	18850
	difference	144%	152%	9%		0%
6DM	SURVEY, 2007	7490	4090	15%		27650
	REHABILITATION, 2011	12845	5725	21%	1100	27650
	difference	171%	140%	6%		0%

Table 8.2. Measuring change in cases studies area: before (2007) and after rehabilitation interventions (2011).

Changing Strategies per Architectural Period of Historic Liceu

In rehabilitated Eclectic *liceu* 1PN, the re-establishment of the building's entrance, although now via a lateral door, made students return to an entrance in the main facade. The new building inserted in-between buildings was designed with a contemporary language and materials as internationally advised (ICOMOS, 1964), and the roof is completely occupied with HVAC equipment, impacting the view from nearby buildings but not from the patio or the street level. However, the location of this mass at the core of the patio, even with a transparent cafeteria in the patio level, mitigates the views of the rear of the *liceu* building as a

whole – a privileged historic view for Arch1 (2010) and 1PN-SD (2011). The facade of the 1960s sports pavilion was covered with a metallic mesh that now unifies this building and the newly built sports pavilion, making it indiscernible from the first intervention, therefore not following the international conservation charter recommendations (ICOMOS, 1964). In 2RF, the other Eclectic *liceu*, the intervention did not take the opportunity to update the name of the building to the current name of the institution. The new sports pavilion was designed with contemporary language and its significant mass has its visual impact reduced by its location, away from the public realm view. The link with the community is mainly established in the Auditorium, for it has been located on the lateral street level, creating a new urban front with a facility for public use.

The pattern immediately found in rehabilitated Modernist *liceus* was the use of the roofs for the location of HVAC equipment. 3DG has new volumes intersecting the original building in specific locations, to hold a planetarium/laboratories and a teachers/library building. The first building is very close to the historic building, using the same volume proportion, colours, windows metric and shutters, making the original and the contemporary addition difficult to distinguish, which goes against international recommendations (ICOMOS, 1964). The teachers/library building preserved the same layout and language used by Arch1 in 1PN, with minimal adjustments to align the new window height with the historic windows, therefore preserving the same language used in the rehabilitation of the Eclectic 1PN. The analysis of the architectural design of additions suggests that each volume presents a different aesthetic idea. The removal of the pitched roof on the workshop building and a small lateral extension on that building, with a new architectural language to incorporate emergency stairs and lift, follow the language used in the new exterior pavilion, added on the south part of the plot. The other Modernist *liceu* (4FL) preserved the building mass and from the outside, the change was mainly found in the different window frames applied.

Finally, in rehabilitated *Estado Novo liceus*, HVAC was located in the attics, mitigating its impact on the exterior, while the most technologically heavy spaces (e.g. canteen and laboratories) were located in the extensions, reducing the impact on the historic buildings. In both cases, new buildings used codes to be distinguishable, such as materials and colours. However 6DM now has an extension linking to the new building which used a pastiche language, mitigating the possibility of distinguishing the old from the new. Unfortunately it was not possible to discuss this option with the author.

Changes in Gross Area: Additions and Extensions

Historic *liceus* now have additional gross area. This supplementary area was obtained either in the historic buildings or outside these buildings. When in the buildings, the options to construct additional area were upwards, downwards or laterally. Among all the seven case studies, including the pilot case, only in 6DM was the design option to build on top – a solution previously found in developments since the original construction (e.g. 3DG and 2RF). When building on the side (1PN, 2RF, 3DG, 4FL and 5CM), the interconnection of spaces was designed in different ways (see previous Table 8.1). This topic will be discussed further in the next section.

According to the analysis of sites, and the options taken to provide additional area, it seems that cases rehabilitated by Arch1 were those which were more intrusive in the approach taken towards the siting of new buildings in relationship with the historic buildings. Firstly in 1PN, although the location of the new building means that all of the levels are now linked at each level, avoiding the need to come to the ground level to go to another building's upper level, being at the core of the setting (see Figure 8.2A) emphasised a 'corridor space' (Arch1, 2010) on the west side, while creating a small patio on the east side, and limiting the control of the whole patio from the main *liceu* building, where the school board is located. The SD offers an interpretation for the fact that this new patio is not used by the students, which is linked to the students' perception of control: 'perhaps it is an unconscious attitude, as they feel more under surveillance here' (1PN-SD, 2011). This interpretation is in line with the origin of the design of school buildings where schools were building types where power relations establish that there is the watched and the vigilant. This has always been a requirement in the design of schools, very closely linked to the concept of the school climate. The research found that this topic was not on the architects' mind, as the option taken by Arch1 show that, by not taking into consideration this typology feature, the prediction of outcomes was not accurate, as the mapping of the students' use of outdoor spaces, perceived by staff and teachers (Q21D and Q20F) show (see Figure 8.2B).



Figure 8.2A and B. Rehabilitated 1PN in (2011): Courtyard and results from questionnaires.

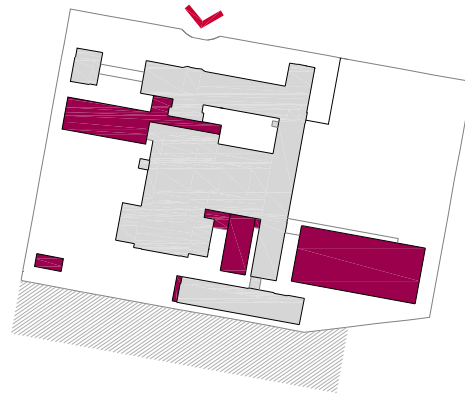
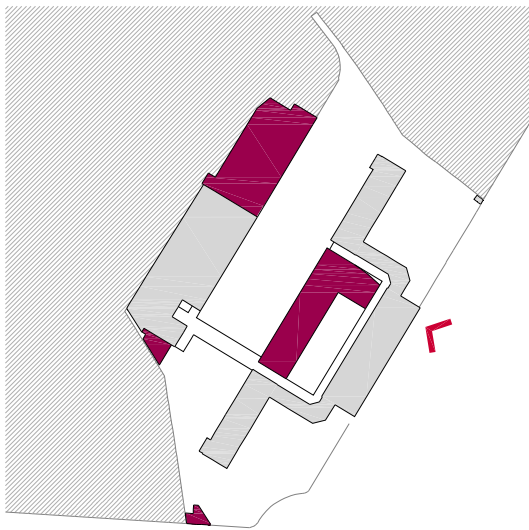


Figure 8.3. Works by Arch1: Rehabilitated *liceus* 1PN (2011) and 3DG (2012): in dark red the location of the new buildings.

The analysis of the second case designed by Arch1 (3DG) should be conducted within the context of Modernist *liceus*, as a functionalist building which has been conceived to be seen from all angles, thus presenting a challenge for the location of the new volumes required. The situation in 3DG was reported to have been difficult: 'We had great difficulty here because this building is visible from all sides. This is a great house, gigantic' (Arch1, 2010). This statement confirms the most used, and eventually less difficult, solution for mitigating the impact of additions in historic *liceus*: to site buildings in the less visible areas from the public realm. Although in 3DG the building had already been changed and the foundation level used for classrooms, therefore reducing the amount of new area needed, the strategy used was the insertion of the new additions within the matrix of the historic building, preserving what Arch1 considered 'the most symbolic views' (Arch1, 2010) (see Figure 8.3). The library building, the

new built mass on the west, parallel and setback from the main facade, then became 'the most controversial intervention', Arch1 said, while the sports pavilion acted as a screen for the 'horrible backyard' which 'was impairing the symbolic view of the building' (Arch1, 2010). In 4FL, the other Modernist *liceu*, Arch3 used the expression 'to grow down' (2012) referring to the area gained through excavation at the foundation level, also closing the covered exterior area in the patio (see Figure 8.4). This option was due to legal constraints, as the building was awaiting listing:

'[4FL] could not grow on the sides because it occupied the plot completely, it couldn't grow up because we didn't want to pervert the existing building – even though the current version is not the original version of the *liceu*. The only option we had was to grow down' (Arch3, 2012).

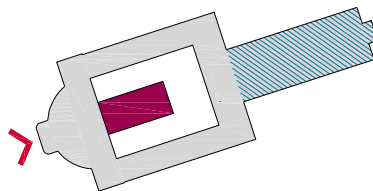


Figure 8.4. Rehabilitated 4FL (2010), by Arch3: in dark red the location of the new buildings; in dashed blue the new underground area.

Changes in Covered Areas and Pavements

Another important feature in schools' outdoor areas, found in all historic *liceus'* original design, was the provision of shelter and shade with covered areas for students' social interactions. As previously observed, in 2007, some cases had these areas closed and adapted to classrooms (3DG, 5CM, 6DM). Rehabilitation works kept these spaces closed, with the covered playground in 4FL converted into an auditorium, reducing the school's already diminished outdoor space (refer to table 8.1). Shelter and shadow in outdoor areas are important for students. This reduction of covered areas may reduce the use of outdoor spaces. Furthermore, paved exterior areas (hard) were enhanced while soft areas were reduced. It can be concluded that these changes were mostly based on providing good access and responding to current hygienic standards, to the education (sports) brief needs, and to the objective of reducing maintenance of outdoor areas.

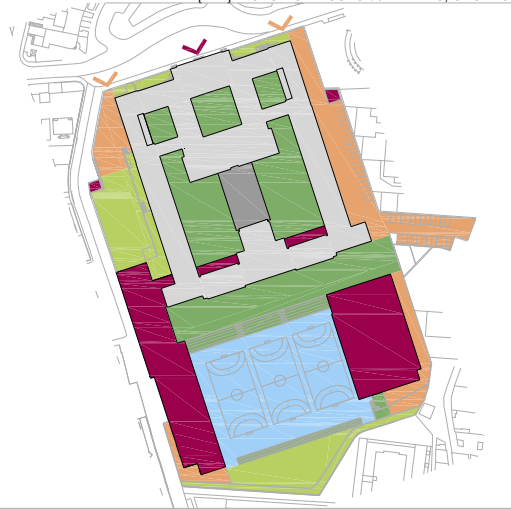
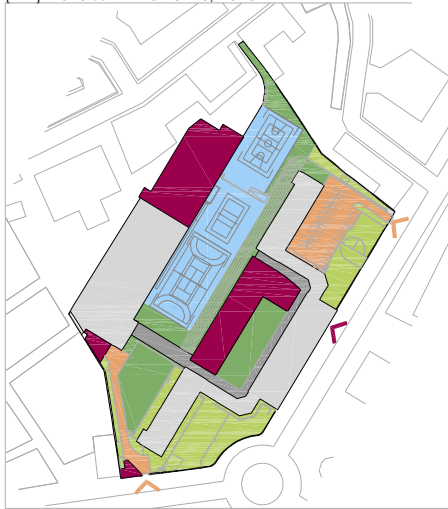
The analysis of effects of rehabilitation on outdoor pavements and equipments found that outdoors can now be clearly identified as ascribed to sports, vehicles or social interaction (see Figure 8.5). These last spaces can be analysed according to its pavements, considering as soft areas the permeable areas of trees, bushes and grass, and hard areas those paved with impermeable materials. In all schools the renovation of trees was observed. This fact was referred to as a 'loss' by some teachers and staff, namely in OPM, 3DG and 5CM. However, caution should be taken when interpreting these answers. For example, in OPM staff members referred to the loss of the gardens, but there had been no gardens before the interventions, with cars parking on the place of the original botanical garden. This example shows nostalgia for a previous situation, which eventually some older participants might have experienced, but which seems to be in users' memories, providing misleading data.

The next Figure 8.5 illustrates the cases' general site plans after rehabilitation. In all cases, except 4FL, the design enabled an independent entrance for the partial use of the plot by the community, namely for the use of sports areas.

[1PN] LICEU de PEDRO NUNES, LISBON

REHABILITATED ECLETIC *LICEUS*

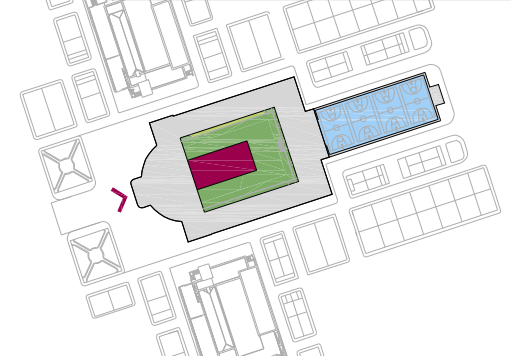
[2RF] LICEU RODRIGUES de FREITAS, OPORTO



[3DG] LICEU DIOGO de GOUVEIA, BEJA

REHABILITATED MODERNIST *LICEUS*

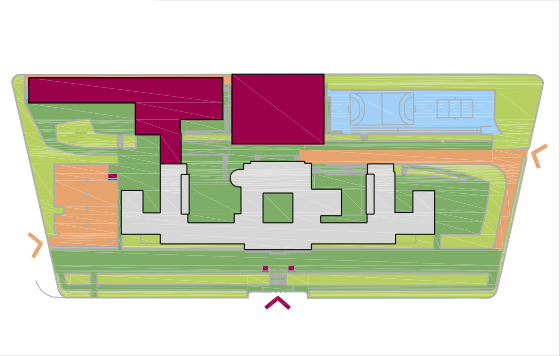
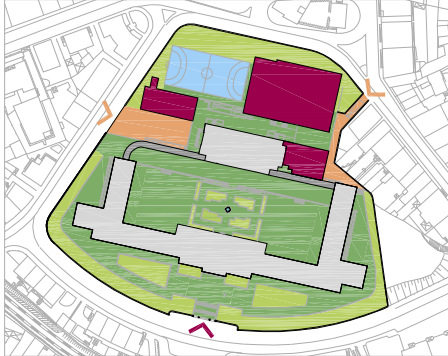
[4FL] LICEU D. FILIPA de LENCASTRE, LISBON



[5CM] LICEU CAROLINA MICHAELIS, OPORTO

REHABILITATED *ESTADO NOVO LICEUS*

[6DM] LICEU INFANTA D. MARIA, COIMBRA



- SPORTS (PITCHES AND GAMES COURTS)
- SOCIAL SPACES (HARD SURFACE)
- SOCIAL SPACES (SOFT SURFACE)
- CAR PARKING AND DELIVERIES
- PEDESTRIAN MAIN ENTRANCE
- VEHICLE ACCESSES

- BUILDINGS AREA
- COVERED AREAS
- NEW BUILDINGS

LICEUS [CASE STUDIES]

SITES: BUILDINGS AND GROUNDS
[REHABILITATION, 2011]

GENERAL SITE PLANS

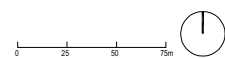


Figure 8.5. Site plans after rehabilitation of all cases: buildings and outdoor areas (2011).

In 4FL, the original outdoor benches that were located on the edge of the interior small patio, close to the building walls, were replaced by new benches, now located in the centre area of the patio (see Figure 8.6A). However, it seems that Arch3's design has not been sufficient for keeping the students inside the school at intervals (see Figure 8.6B). This happened not just in this case. The assessment of the students' behaviour during intervals, through the lens of staff and teachers, revealed that, in all cases, after rehabilitation there was a significant displacement of students from indoors to school outdoors. Apparently this happened due to a new legislation on smoke which forbids smoking in public facilities, and which came into force recently in Portugal. This fact appeals to caution in the interpretation of results, although it reveals that the effects of this law, from 2007, were not given the required consideration in the rehabilitation, with school directors now acknowledging the bad image that is being displayed to the public realm (1PN-SD, 2011).

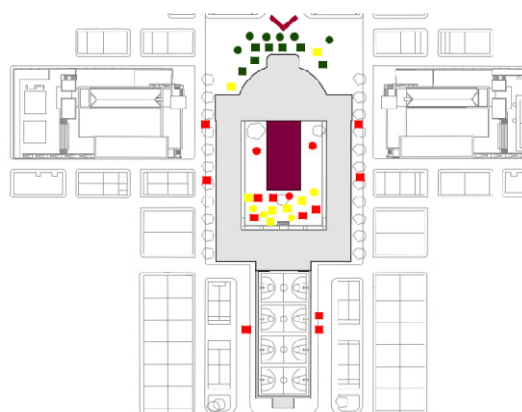


Figure 8.6A and B. Courtyard of rehabilitated 4FL in (2011): perception of teachers (question 21D) and staff (question 20F) of how students occupy the outdoor spaces of *liceu* at intervals.

As for design strategies based on the international conservation principles of minimal, compatible, contemporary, and reversible interventions in the outdoor areas, it was observed that new materials were used in pavements, reducing the amount of green areas, therefore reducing maintenance, but also reducing the sensory effect of green areas not replaceable by other materials.

Changes in Accessibility and Inclusiveness

Rehabilitation interventions had the purpose of adapting the building to current legislation on accessibility and inclusiveness (Parque Escolar, LPDM-CRS and CPD, 2008) hence requiring the revision of the existing circulation. The main change in the existing accessibility system of the outdoor areas is the strategic introduction of ramps, particularly, or almost uniquely, at the

main entrance (0PM, 3DG, 4FL, 6DM). However, in 5CM and 6DM the accessibility from the public street needs to take place in a secondary gate, due to the main staircase from the *Estado Novo* period. Then a symbol of economic and political inaccessibility, the staircase is now an inaccessible access point for physically unable individuals. It is therefore still a selective and differentiating feature but now with a new meaning.

The Table 8.3 below summarises the changes observed in the rehabilitated historic *liceus* attributes, most importantly with regard to townscape and landscape values after rehabilitation (2011) compared to the situation prior to rehabilitation (2007).

		Aesthetic periods					
		E c l e c t i c		M o d e r n i s t		N e w S t a t e	
SITES	Design changes in physical characteristics of <i>liceus</i> (occured between 2007 and 2011)	1PN	2RF	3DG	4FL	5CM	6DM
Plot	Site area	R	K	K	K	K	K
	Boundaries	R	K	K	K	K	K
	Topography	K	K	K	K	K	K
Exterior spaces	Grounds area (average -15%)	R	R	R	R	R	R
	Sports areas (pitches and games courts)	K	R	R	K	R	R
	Car parking delimitation	E	E	E	-	E	E
	Social spaces: hard surfaces	E	E	E	R	R	E
	Social spaces: soft surfaces	R	R	R	R	R	R
	Circulation (pedestrian and vehicles)	K	E	E	R	E	E
Historic building(s)	Footprint	K	K	K	K	K	K
	Total gross area	K	E	E*	E**	K	K
	Main facade (form, materials, aesthetic)	K##	K	K##	K#	K	K
	Entrance (accessibility)	K	K/R	E	E	E	E
Addition(s)	Total footprint: historic and new (>50%)	E	R	E	E	E	E
	Location (setback, relationship with existing)	R	M	R	E	M	M
	Scale/proportion (relationship with existing)	K	K	K	K	K	K
	Facade (form, materials, aesthetic)	N	N	K	N	N	K/N
Rehabilitation architects		Arch1	Arch2	Arch1	Arch3	Arch2	Arch3

Notes: R: reduced value, M: mitigated impact on value, K: kept value, E: enhanced value; N: new value) * at building plan level; ** below the building. #change of windows design; ##inclusion of exterior blinds in windows.

Table 8.3. Summarising physical change of rehabilitated *liceus*: 2011 when compared with 2007.

8.2.2. Current Architecture

This section briefly identifies physical changes in historic *liceus*.

Case Study 1 (1PN): *Liceu de Pedro Nunes*, Lisbon: 2007-2010



Figure 8.7. 1PN (2010). Source: PE

To comply with the required gross area, Arch1 gained area at the foundations level in 1PN. The two new volumes, with one inserted at the core of the historic building's patio, enabled a physical connection through exterior bridges on every level, and provided two staircases and two lifts. The new sports pavilion was built as an extension of the 1960s annex and now has a new 'skin' – a new common facade. The original symmetrical plan of the *liceu* was not followed: the resulting building is not symmetrical, although the preservation of the repetition of spaces-types helps with way-finding. Colour of doors is the same as applied in 3DG. HVAC equipment occupies the attics and the roof of the new building.

According to Arch1, the design of a new entrance hall was justified by the need to preserve the historic staircase from the intensive use of students (Arch1, 2010). The loss of the centrality of the entrance, in such a symmetrical building, seems to indicate to users that they are being offered a secondary entrance, as the main door is closed except for special events. Trespassing the historic building, a new triple high atrium, with a lift and a wide stone staircase establishes a new and modern environment, with a vertical visual connection with the upper floor, where the distribution to the buildings and to the outdoor areas takes place. The experience of using the original wooden historic staircase was therefore replaced by the experience of using a contemporary design staircase, in concrete and stone, and highly illuminated by natural light. Both Arch1 and 1PN-SD conceded that the main staircase was now only used for special events or for science demonstrations. By changing the entrance, the historic and monumental

staircase was deliberately patrimonialised and turned into a heritage feature. It is the researcher's opinion that this form of cultural patrimonialisation enhances the distance between individual and heritage; it turns heritage into something that is not to be used every day but to be observed as a 'scenography' (1PN-SD, 2011). Considering architectural heritage as an untouchable museum piece does not provide a sense of ownership, of responsibility, of duty of care and stewardship.

In the case of 2RF, the building provides facilities to two institutions: the Basic and Secondary School Rodrigues de Freitas, and the Oporto Music Conservatory. Some facilities are shared while others are used exclusively. The analysis focused on the shared and specific spaces of the former *liceu* institution, i.e., the basic and secondary school spaces. Painted panels were placed on top of the wall tiles along the corridors. The extension area was gained at foundation level with small extensions: the addition of two volumes, with no physical contact with the historic building; a new music conservatory located where the main temporary pavilion was, and the sports pavilion on the former sports area. The theatre was replaced with a resources centre and changing facilities; the eating area was elevated to level -1, but the kitchen kept on level -2; two staircases were changed (beside the former theatre, the current resources centre and the historic gymnasium).

Case Study 2 (2RF): *Liceu Rodrigues de Freitas*, Oporto: 2007-2018



Figure 8.8. 2RF (2010). Source: PE

In summary, in the rehabilitated Eclectic *liceus*, window frames were restored; there was also a significant impact at the attic level with the placing of new technologic infrastructures with externally visible ventilation chimneys (OPM) or at rooftop level, with the addition of a volume higher than the facade of the historic buildings. Turning now to rehabilitated Modernist *liceus*, here is a brief summary from the setting view: there is a significant impact at the roof level of new technologic infrastructures and a significant impact in the windows due to the new steel frames.

Case Study 3 (3DG): *Liceu Diogo de Gouveia*, Beja: 2009-2011



Figure 8.9. 3DG (2010). Source: PE

Case Study 4 (4FL): *Liceu Filipa de Lencastre*, Lisbon: 2008-2010



Figure 8.10. 4FL (2010). Source: PE

And finally, rehabilitated *Estado Novo* liceus: the window frame materials were changed but the dimensions/expression of the original wood design were retained.

Case Study 5 (5CM): *Liceu Carolina Michaelis*, Oporto: 2008-2010



Figure 8.11. 5CM (2010). Source: PE

Case Study 6 (6DM): *Liceu D. Maria I*, Coimbra: 2008-2010



Figure 8.12. 6DM (2010). Source: PE

In order to evaluate if a building type's integrity and authenticity has been respected in a rehabilitation intervention, one must assess how a building and its use has been affected, what has remained, how continuity has or has not been guaranteed, and what remainders of the original building type concept prevailed on-site.

The rehabilitation effects on historic buildings' facades have generally improved the existing physical condition and preserved the existing materials, textures and colour palette/scheme. The only intervention in historic facades that changed its original significance was in the sports pavilion of 1PN, built in the 1960s. Arch1 deliberately decided to nullify this presence by locating the new sports pavilion beside the 1960s building and applying a mesh along both buildings. The end result is a long wall, where no visual difference exists between the 50 year-old building and the new one. Although the historic gymnasium was kept intact, the changing rooms have been altered. The effect can be observed in Figure 8.1 below in that there is no apparent evidence of the historic building, which raises questions regarding the interpretation of what place authenticity means and the meaning of respect for all layers of history, as international conservation charters advocate.



Figure 8.13. Rehabilitated 1PN outdoor areas, with fully equipped sports pitches, and new continuous facade for 1960's pavilion and new sports pavilion.

Only in case 4FL were the original windows required to be replaced due to thermal performance issues. Although changing the original design and aesthetic expression, IGESPAR appraisal accepted the proposed new design. Nevertheless, 4FL-SD used this topic to refer to a doubt on the durability of new materials – an issue raised by teachers and staff.

Arch1 referred to the issue of window shutters that have been added in historic *liceus* though time (1PN and 3DG). The rehabilitation solution was the same for both *liceus*: metallic grey exterior shutters. The relevance of this topic relies on the importance of luminance in school buildings' teaching and learning spaces, which must be controlled – a feature not present in the original *liceus*.

Names on facade

Both interventions by Arch3 valued the naming of public secondary schools. In 4FL it was found that the small marble plaque found in the building's facade in 2007 was replaced by the

inscription *Agrupamento de Escolas de Filipa de Lencastre* (*Filipa de Lencastre Cluster of Schools*). The letters used now have a contemporary font design, built in stainless steel, and are smaller than the original inscription from the 1930s.

Interestingly, the case of *Estado Novo liceu* 6DM, which had never had a name on the facade (see Figure 8.14A), now exhibits two designations over the main entrance of the historic building: *Liceu Infanta D. Maria*, the building's designation in the upper level, and *Escola Secundária*, the current institutional name, in the lower level, right over the main entrance portico, below the balcony (see Figure 8.14B). Here, the same font and material used in 4FL was also used. The addition of the word '*liceu*' in 2010 suggests the aim to preserve the distinctive character of *liceal* education. Arch3 was quite sure that the word was already there before the interventions, suggesting that naming is an intrinsic element of *liceus* buildings.



Figure 8.14A and B. 6DM: main facade before (2007) and after rehabilitation (2011). Source: PE.

Therefore, it was concluded that, even being currently used as secondary education institutions, the *liceus* buildings preserved their original name on the main facade. The continuity of the place name - by keeping, or introducing (6DM) the words on the facade - has a potential heritage significance, enabling the establishment of meanings and associations with past events: a distinctive type of secondary education.

The historic-architectural value of rehabilitated historic *liceu*: past and present

The extension to 1PN (as described above) was described by the architect as the main idea for this intervention: to separate the quiet areas of teaching from the more noisy sports areas (Arch1, 2010). However, the questionnaire answers from the 1PN staff and teachers found that the characteristic of the school that participants disliked the most (Q12.1) was these spaces, regardless of the use of transparent glass at the ground level, as Arch1 specifically reported. The 'central building', as it was generally named, was referred to by teachers to as being 'a strange body in the way it was sited', showing dislike for this design option. The originally empty 'core' of the school, is now occupied with a building, and one of the teachers summarised it as a feeling of the school having lost part of its identity, saying that it misses 'leaving the central (old) building and seeing the broad patio with trees'. It seems that the (considered) benefit of joining all four buildings at all levels, a situation that did not exist previously, does not overcome 'the visual impact of the new building', as this teacher with training in architecture explained.

Functional-spatial layout and internal accessibility of rehabilitated historic *liceu*

The plan layout of historic *liceus* enables an understanding of the pre-existent sequence and hierarchy of secondary education functional spaces and the inherent accessibility. Generally, this layout identity is composed of specific historic learning environments – classrooms, laboratories, library, gymnasiums – and by the atrium and vertical accesses in the form of a monumental staircase. On the other hand, the NLE spaces, focus on classrooms, laboratories, resources centre and sports pavilions, considering access to the formal spaces of learning, were to be educational spaces named 'informal learning environments' (see Chapter Four). From the analysis of all *liceu* plans, before and after intervention, some particular changes were found to have occurred in the *liceus'* typology physical attributes which mostly influence the experience of interior spaces: the location of specific functions and the circulation layout. Table 8.3 summarises the findings from the analysis of plans, in comparison with the situation in 2007, which are further discussed below.

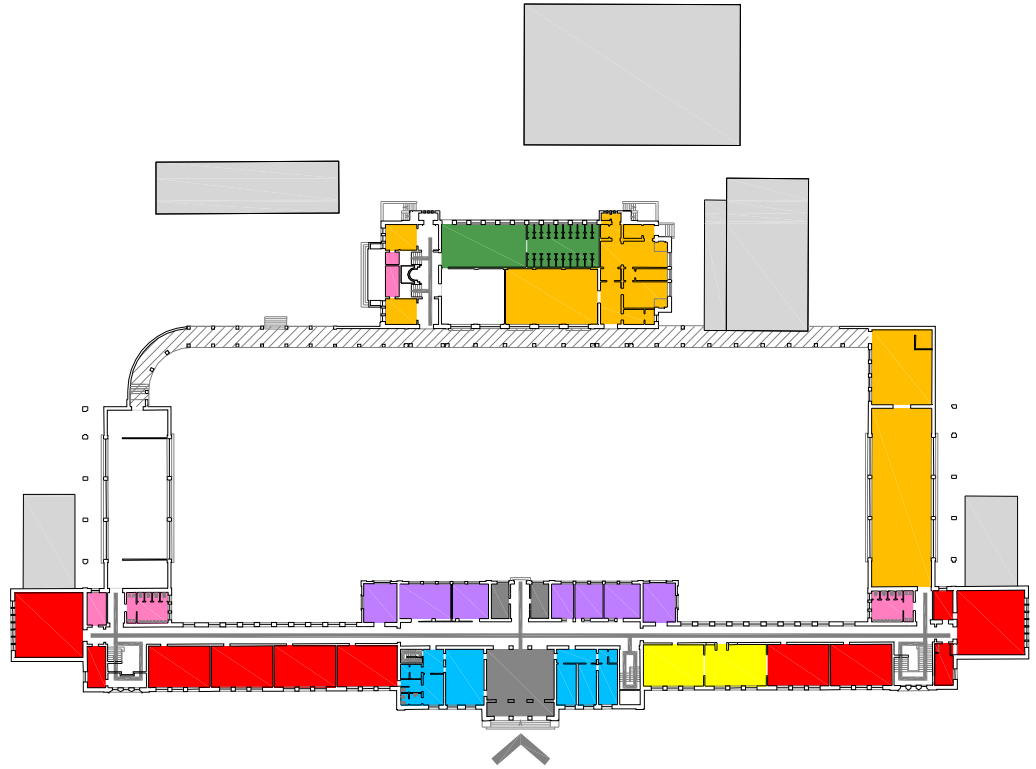


Figure 8.15. 5CM Architecture and Functions: level 0 Plan (survey 2007).

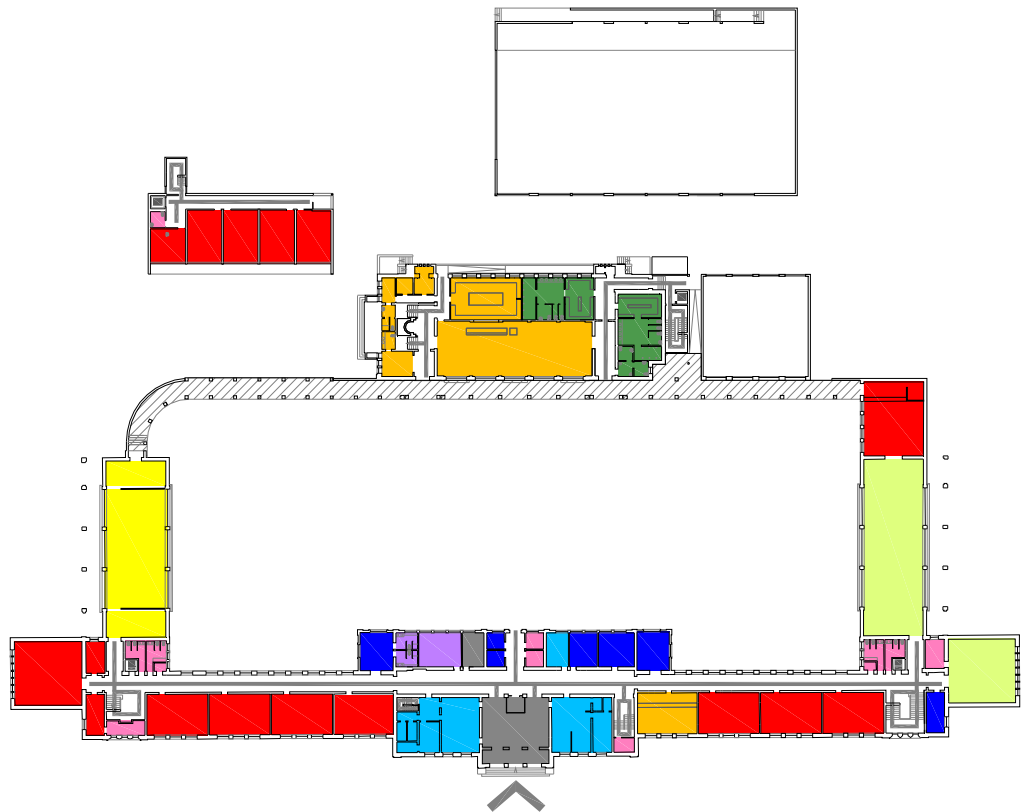


Figure 8.16. 5CM Architecture and Functions: level 0 Plan (rehabilitation 2011).

Architects		Arch0	Arch1	Arch2	Arch1	Arch3	Arch2	Arch3
types of functional spaces in rehabilitated historic liceus		0PM	1PN	2RF	3DG	4FL	5CM	6DM
specialised rooms	classrooms	K	K	K	K	K	K	K
	historic science laboratories/laboratories	K/N(ah)	K*/N(a)	L/N(l)	K/N(ah)	L/N(h)	L/N(h)	L/N(a)
	ICT rooms	K(l)	N(a)	K(l)	N(a)	K(l)	K(l)	K(l)
	workshop studios	K	K	K	K	K	K	N(a)
community	Adult training/continuing Education	-	-	-	-	-	-	-
	historic library/resources centre	K/K	K*/N(a)	K/N(h)**	L/N(a)	K*/N(h)* *	K*/N(h)	K*/N(h)
	historic gymnasium(s)/sports pavillion	L/N(a)	K*/N(a)	K/N(a)	K*/N(a)	K/N(a)	K/N(a)	K/N(a)
	multipurpose room	N(a)	N**	N(a)	N**	N(a)	N(a)	K/N(h)
	canteen/cafeteria	N(a)/K	K/N(a)	K(l)	K	N(a)/K	K/K	N(a)/N(h)
students	student's common room	N(a)	L	L	K	L	L	L
	students stationary	K	K(l)	K(l)	K	N(h)	N(h)	N(h)
staff	teachers rooms	K	K(l) /N(ah)**	K(l)	K(l) /N(ah)**	K(l) /N(h)**	K(l) /N(h)**	K(l) /K(h)**
	staff rooms	K(l)	K(l)	K(l)	N(a)	K(l)	K	N(a)
management	school board	K	K	K	K	K	K	K
	archive/storage	K	K+N(a)	K+N(a)	K	K	K	K
	reception/administration	K	N/K	K	K	K	N/K	K

Location: (a) in addition; (h) in historic building; (ah) in historic and in addition; (l) changed location within historic building; change of use: Kept (K), New (N) or Lost (L).

Table 8.4. Rehabilitated historic *liceus*: changes in location and use of main functional spaces (2010).

The previous table is based on the briefs given to architects and show that classrooms, workshop studios and management spaces were generally all kept in the locations they had in 2007, with most still in their original place. This finding suggests a major respect for the building organisation than to the model proposed by PE (see Chapter Seven) to respond to NLE. It can be concluded that NLE were conditioned by historic *liceus*.

Merging contemporary uses with traditional spaces when reflecting education demands

The change observed in the existing spaces and functions aims to provide contemporary environments in an historic context, while adapting to current education requirements. The analysis found that functional space(s) current location can occur: in additional areas (a); in historic building (h); in additional and in historic spaces (ah); or may have just changed location within the historic building (l). These functional space(s) changes took one of three forms: keep (K), new (N) or lost (L).

Classrooms and specialised rooms

From Table 8.4 above, it was found that the anchor spaces of a school – the classrooms – retained their function and location. The same was generally observed for the workshop studios, for arts and technologies. ICT rooms mainly remained in their existing spaces, and in some cases were moved and grouped into a different location within the existing building. This design option is based on the fact that this concentration of infrastructures could enable minimal intervention in the existing fabric, entailing what Appleton names ‘sacrificed areas’ (2003, p. 159). Following this idea, Arch1 took a different design option and located ICT rooms in the new building, therefore avoiding affecting the existing fabric.

Changing the location of the spaces which imply the most adaptation (and therefore the most significant intervention in the existing fabric), was a design strategy also used by Arch1 to locate the laboratories. Historic laboratories required significant interventions, mainly due to safety and security reasons, and the current education philosophy suggested a new classroom design layout. Furthermore, new furniture and new equipment required a different classroom layout in itself, with the fixed workbenches surrounding the space and movable workbenches in the middle. Such a strict layout found different answers among architects. While some considered that an example of an historic laboratory should remain (0PM, 1PN, 3DG), all of the other interventions did not retain this historic space of *liceal* education. The adaptation to new requirements changed the whole historic layout, defined by the space, the furniture, the equipment and the finishing materials, therefore a valued space for education is now lost.

Library and resources centre

Historic libraries were kept and their furniture, fixed and/or movable, was restored, recognising the value of ‘designed for purpose’ furniture, as found in Chapter Six. However, changes in these spaces suggest that they were no longer suitable for the original purpose: a

students' workplace. Therefore, in most cases, the rehabilitation strategy was to restore the existing space and elements, and change its use to become an extra teachers' common room. In addition, a new space was established for the location of the contemporary resources centre/library, either occupying other historic space (2RF, 4FL, 5CM, 6DM) or locating it in the new extension (1PN, 3DG) – the option of Arch1. Arch3 explained that this option enabled the space to keep its character, in detriment of a radical change of the inherent characteristics, further explaining that a more respectful use (by teachers) was expected (Arch3, 2012). In the case of 2RF, the new resources centre was located within the historic building, and the historic library was kept with the historic character, holding and preserving the historic library archive. It is used for commemorations and cultural events. It was referred to by the school director as a questionable option as students do not go there anymore (2RF-ED, 2012). This fact suggests that the provision of new spaces by replacing historic ones may attract more students.

The design value of original fabric of historic *liceu*: materials, construction system

Physical changes to integrate ICT & other technical equipment

One of the challenges in architectural rehabilitation is to introduce new technologies within historic buildings and to minimise their visual impact by hiding all of the inherent exterior equipment from view as much as possible. In the *liceus* OPM and *Estado Novo liceus*, the architects were able to locate the HVAC technical equipment in existing pitch roofs. In 1PN, the strategic location of the new building, in the centre of the historic site, meant that all equipment could be housed in the flat roof of the new building. In the Modernist *liceus* the flat roofs were used too (see Figure 8.17A and B). In these cases, visibility from the grounds was insignificant, therefore not impacting the townscape value. This design strategy seems to be beneficial for the preservation of the character and identity of the historic buildings.



Figure 8.17A and B. Rehabilitated roofs in Modernist *liceus* 3DG and 4FL: technical equipment.

8.2.3. Current Furniture, Fixtures & Contents

As previously discussed (view Chapter Four) the history of this building type cannot be told without reference to movable historic education assets such as furniture, fixtures, and movable educational objects, i.e., contents. The rehabilitation of historic *liceus* brought to the debate the future of historic educational resources. The preservation of the buildings in use since their inauguration has preserved commemorative plaques, wall inscriptions, artistic works, and a significant number of historic educational resources, even though they have been considered obsolete for current education. As found in Chapter Six, collections remained in historic *liceus* as decorative elements, for example maps on walls and other education objects inside original built-for-purpose furniture/fixtures. Some original chairs and desks were still in place – in a tolerable condition – and blackboards were still in use in the classrooms, while many have been kept in attics and in storage.

The use of historic *liceus* as heritage resources for education seemed indisputable for the researcher. Based on the recommendations issued on heritage education in international Charters and Conventions (for example UNESCO/UIA, 2011), the researcher assumed that rehabilitation would enhance the use of the historic buildings or of the historic artefacts for the purposes of education. However, when asked, teachers responded that they made no use of the buildings or of the educational collections for educational purposes.

The educational value of contents

As stewards of local heritage, it is important to understand how teachers perceive buildings as architectural heritage and as an educational resource, including movable educational resources. The questionnaire results indicate that 83% of teachers in all schools were aware of the existing historic-educational collection of their school (Q16D); however, among those who recognised the resources' existence, only 29% had used the collections as teaching educational resources (Q16.1D), with all teachers using those resources in 2RF.

The educational value of the building

Asked about using the building as an educational resource, 57% of participants in this research responded positively. According to the literature, using the local environment as an educational resource can play an important role among students who feel themselves to be conservators of the local heritage, enhancing a sense of sharing and of collective memory. However important as an indicator, it does not provide further data on how the resources were used and for which exact purpose. The researcher, however, had a small indication that

this question had a small, but significant, effect on teachers, as following the survey, a teacher asked the architects to go to the schools and explain to her students the values of the *liceu* where they were (teaching and) learning.

The value of furniture

The strategy towards school furniture was a disaster for the character of historic buildings. PE decided to acquire new modern school furniture, with no interaction with the architects beside being given the opportunity to choose colours among a pre-selection made by PE. Furthermore, with the amount of schools under rehabilitation, the options for furniture became reduced and the furniture is not in harmony with the quality and care of the rehabilitation design (see Figure 8.X). Beside this impact, and more importantly, no further use was given to the prevailing furniture in place, either historic or more recent. Many were thrown away.

The value of names and inscriptions

Citations in *liceu* walls found before interventions (see Chapter Six) were generally preserved. However, an exception was found in 4FL when, during the site survey conducted in the rehabilitated 4FL by a staff member, she displayed on her mobile phone a photograph taken before the interventions showing an inscription on the main entrance facing those who entered. Pointing up, she asked: 'Do you see it there now?' The photograph was sent to the researcher, and it was very similar to the one provided by Arch3 (see Figure 8.18), acknowledging that it was previously known. However, the photograph taken by the researcher during the fieldwork show that the inscription, after rehabilitation, was gone (see Figure 8.19).



Figure 8.18. 4FL: site survey, 2008. Source: Arch3.



Figure 8.19. 4FL: site survey, 2011.

This erasing of dictatorship period citations from a secondary school of the *Estado Novo* had already been reported in another city, Viseu, on a national newspaper as 'a conscious act of sabotage to Portuguese history' (Diário de Notícias, 01 February 2011). The removal of the inscription became an arena for debating whether references to the *Estado Novo* period were legitimate expressions of cultural heritage or symbols of the dictatorship. PE-BAD denied that any indication had been made to remove any inscription (PE-BAD, 2011).

Artistic expression features, such as sculptures (see Figure 8.20), were generally preserved. Symbolic and didactic features have also been preserved, such as the weathercock on top of 3DG, typical of the *Estado Novo* period, with a caravel, symbol of the discoveries period. (see Figure 8.21). The preservation of artistic elements, which are part of each place's history, are mechanisms for users' and visitors' memories, contributing to a sense of place continuity.



Figure 8.20. Rehabilitated 5CM: lake and ceramic artistic elements.



Figure 8.21. Rehabilitated 3DG: weathercock on the roof.

The significance of the original wording for the communities of architects, educationalists, current and former users, and local people has been valued in rehabilitation interventions, following existing guidelines on the topic (e.g. NSW Heritage Office, 2004).

8.3. Historic *Liceus* Rehabilitation Outcomes (Perceptions)

Perceptions of the historic and the contemporary environments reveal the feelings towards the places. Schools have a role in supporting the education community and contribute to the establishment of relationships with the place of education. However, it has been recognised that, 'architects design spaces, but it is the commitment of the users that makes them enjoyable places' (The Scottish Government, 2007, p. 15). In the case of architectural rehabilitation, questions emerged after interventions in order to understand the actual effects of interventions in socio-cultural values: What are the values experienced and ascribed by the school community to the new learning environments provided in an historic context? Are users interested in making rehabilitated *liceus* enjoyable places to teach and learn?

This section discusses the short-term effects of rehabilitation interventions in users' perceptions. Results from surveys of the school community groups were analysed to find what has changed with rehabilitation and to try to establish a link between current teaching and learning environments, with historic and contemporary design features, and a sense of place, a sense of continuity and a sense of collective commitment to the preservation of the cultural

values of place. This section will focus on 1PN as an example to illustrate the type of data gathered and its analysis.

8.3.1 Senses of (Rehabilitated) Place

Teachers and staff were asked about their work environment to understand how they felt about the rehabilitated *liceu*. When asked how satisfied teachers were with the changes to their workplace (Q5D), most answered positively and when asked if 'in general, the rehabilitation intervention enhanced the physical and environmental conditions for teaching and learning practice' (Q6D), 60% of the teachers agreed. Those who agreed (Q6.1D) highlighted the ICT facilities in the classrooms, the new materials and good rehabilitation condition which 'invites students to have better behaviour', safety in laboratories and the renovation of school furniture. Those who did not agree cited the temperature and humidity levels in winter and in summer.

The organisation of spaces according to curricula department areas (Q8D) was considered to have enabled an efficient functioning to 60% of the respondents (9/15), indicating a positive reaction to the new layout. On the other hand, 60% of the respondents (9/15) considered that the accessibility and circulation in the school had not improved (Q7D). The arguments given considered the building to be 'too labyrinthine', identifying the inadequacy of entrances and exits, the bigger distances, the lost visibility and the patio space which has been 'broken'. One respondent summarised most opinions, saying it was now 'longer/more extensive (circulation) and complex (accesses) and therefore with more risks (safety/security)'.

An unanticipated finding involved the cleanliness of the school, with the most significant number of references to the word *limpo* (clean). This factor of environment quality stresses the important role that clean and well-maintained schools plays in the learning and teaching process. Research has identified cleanliness as a physical feature that supports a positive learning climate (Uline, Tschannen-Moran and Wolsey, 2009). This is a positive finding for the overall aim of the rehabilitation interventions: to enhance users' performance.

Currently, there are entrances for pedestrians and for vehicles, perfectly established parking areas and traffic paths, separated from pedestrian paths, a design feature considered to improve feelings of safety and security for users, which in fact was captured in the students' acrostic poems, who in all cases used the letter 'S' to express this feeling. As explained in Chapter Six, in 'a temporary situation to avoid fights at the school main entrance door' (1PN-SD, 2011), students were using the rear gate as the main site entrance, i.e. the deliveries

entrance for the canteen, or 'the place of potatoes and garbage' (Arch1, 2010). Now, 1PN regained its main entrance through the main facade. However, the door used is no longer the original central door but the right entrance door. The loss of the centrality of the entrance, in an Eclectic and therefore classic and symmetrical building, seems to indicate that a secondary entrance is being offered. As the main facade was not articulated to indicate this (Figure 8.21), the new entrance misleads users.



Figure 8.22. Case 1PN by Arch1, before and after rehabilitation.

Working environment in 1PN: teachers' opinions

Focusing on particular characteristics of the places where teachers teach (Q9D), most considered that the thermal comfort did not improve (12/14), and more than half (8/14) considered that the same happened to safety/security and accessibility. Acoustic comfort and air quality was found difficult to evaluate for most teachers (7 and 10/14). For one participant, the answer was 'it is the same', considering therefore that there was no change. Comments and justifications mainly focus on the introduction of HVAC systems (which cannot be put to work due to budget constraints), the introduction of fixed windows (which do not allow natural ventilation) and the lack of blackout curtains in classroom windows (which affects ICT projections).

Positive physical changes were mentioned to be (Q11.1D) the new formal learning spaces, such as laboratories, classrooms, teachers rooms, a bar and toilets. The fact that it lost its decaying spaces (PN|D12), its 'degraded and musty look' (PN|D14) and 'kept the same look as before' (PN|D10) were considered positive changes. Space extensions were considered positive too (PN|D13).

On the other hand, negative changes to the building (Q11.2D) were identified as the loss of the science museum space (PN|D01) and the interior circulation (3/15). However, changes to the school patio were given as one of the worst changes (5/13), where the new building has a negative visual impact (PN|D15), and the patio is considered to have been lost (PN|D07 and D11). From its less pleasing physical characteristics (Q12.1D), the teachers have identified the new central building (3/14) and interior accessibility (3/14) as key negatives. However, those changes that please the most (Q12.2D) are the laboratories, the modern equipment, the preservation of the facade and the exterior appearance of the building, the library and the restoration of the doors. The building characteristic which better identifies this school (Q12.3D) is the facade (6/12). The main staircase, the original teachers' room, and the central and original buildings which kept the same style are also mentioned. However, 7/15 felt they have lost a school 'identifier' (Q13D) reported as (Q13.1D): the museum (3), the patio (1) and its trees (1), and the rear facade (1).

Working environment in 1PN: staff opinions

New functional spaces, such as laboratories and ICT rooms, the improvements in other, such as the canteen and the cafeteria, were identified as positive physical changes (Q11.1F) along with the expression 'more and better spaces'. Some participants highlight the 'improved visual look of the school' and that 'the architecture of the buildings is still the same'. Accessibility is referred to in three different ways, by referencing 'the students' entrance', 'the interconnection between all buildings' and the 'the linking access elements to all the building'. The improvement of the grounds is also mentioned (PN|F09) with a particular reference to safety by stating that 'vehicle circulation is better protected' (PN|F14).

On the other hand, negative changes in the building (Q11.2F) linked to students was a 'lack of space for students', 'students not having a place to drink water' and 'students not having a multipurpose room to be in at breaks'. The intervention in the patio is quite often stated as having diminished the space (3) as the following answer clearly expresses: 'the building in the centre of the patio has not only removed the beauty of the space, as it has a negative effect in the meeting of users, removing the visibility to those who arrive at the school through this patio' (PN|F14). The architectural expression of the new building is considered a negative change – 'the new building has nothing to do with the old buildings' (PN|F04) and 'the physiognomy of the students entrance' (PN|F12). The intervention on the grounds is considered as having removed vegetation and leaving 'less exterior space for physical activities'. The green spaces are linked to the age of a school, due to the size that historic trees

have achieved, for which their removal is also considered a negative change. However, two participants say that they cannot identify any negative issues in this rehabilitation of the *liceu*.

The physical characteristics which least pleased staff participants (Q12.1F) were identified by 9/14 participants, including the new building (2), colour, the covering of the 1960s sports pavilion facade, the patio and the students entrance. The 'poor quality of new materials' and the temperature inside the cafeteria due to the use of glass walls were also listed. Although out of context, the smoking activity at the main door of the school is an unpleasant issue referred to here. On the other hand, the physical characteristic which most pleases staff participants (Q12.2F), identified by only 8 respondents, highlights the main historic building, the historic teacher's room and historic gymnasium. Two respondents refer to the facade, because it was preserved, and to functional areas, the laboratories, the separation between cafeteria and canteen, stressing an enhancing in comfort, toilets, and the multipurpose space.

The building characteristic which better identifies this school (Q12.3F) is the facade (5/8). The main staircase, the museum and the physics laboratory are also identified. One respondent, the oldest in the school, wrote 'the name of the school itself' (PN|F09). However, 5/13 felt they have lost a school identifying element (Q13F): the patio (2), 'where all the school community met during the day' (PN|F14), the historic library and the historic sports pavilion. The 'clock in the top of the stairs' was mentioned (PN|F04).

Working environment in 1PN: students opinions

The most used word by students to describe school today, was 'clean', i.e., the most used by the oldest students in 2RF and 4FL, and not used by the youngest group in 5CM, and the oldest group in 3DG. This fact might be explained by the fact that there is more attentive maintenance of the buildings, as well as the fact that these interventions had urban solid waste management projects. This current legal requirement obliged interventions to consider the location of paper bins, garbage bins, waste containers and eco-points. The general reduction of waste further reveals a change in behaviour after interventions and increased environmental awareness.

Although not asked to, because presumably these young students haven't experienced the school before the interventions, students evaluate the intervention: 'Now, my school is the best' [FL|A12|7], 'beautiful and clean, that is how it is now' [FL|A12|7], and 'Now, modern' [RF|A15|7].

Schools' outdoor areas may influence students' attachment to place. Observations on sites suggested that fenced sports pitches occupy a large area, limiting free access. However, the comparison of site plans shows that the areas for sports were already in place, for which the intervention only enhanced pavements and fenced boundaries, for safe and security reasons. Only in 3DG were sports areas reduced, and the fenced pitches now occupy what was originally an informal place to play football, also used by the local community. The fact that no informal space for playing football remained post-intervention is reflected in some of the students' acrostic poems: in the *Estado Novo liceus* without any fenced spaces, the youngest students refer to their school or the 'football pitch' (5CM|A07,12|7; 6DM|A03, 04|7) as 'the school with the coolest football pitch I ever had' (5CM|A03|7), and as one of the reasons for loving the school: 'I love this school, especially the pitch' (5CM|A09|7).

The sense of place dependence was found in the acrostic. The emphasis on the objective of the place, which is teaching and learning, is expressed in several students' responses. This student's expression synthesises clearly the main objective of conservation interventions: 'The best space to learn' [DG|A07|7].

A message was sent to the researcher about the focus of the research on the building and not on the people in the following sentence: 'what is best in this school is not the building, neither the places in the sun, but the people who are part of it and which make this place the best school in Beja' [DG|A08|7].

As an historic value, educational, or academic, value regards the building substance as a piece of education as civilization's progression can be traced by architectural analysis, for which historic architecture is evidence of didactic information and instructive knowledge (Pereira Roders, 2007, p. 114). The educational value of architectural heritage therefore lies in the potential to gain knowledge about the past (Mason, 2002).

The current significance of the word 'liceu'

Pre-intervention, only *Estado Novo liceus* did not bear their name on the facade. However after rehabilitation 4FL has the new school network *agrupamento* (cluster) name, and in 6DM the name was added to the facade.

Results from the teachers' and staff's answers to Question Q03 on the use of the name '*liceu*' showed that 43 out of 168 participants, i.e., a total of 39%, still designate the school as '*liceu*'. The name is still most used at 3DG, whereas in 5CM no participant used the name. As the designation '*liceu*' was a synonym for elitist education before the 1974 Democratic Revolution, and that the designation was officially abolished in 1978, these results suggest that in Beja, the

smallest city in this research, where 3DG is, secondary education is still considered elitist and an association still present in participants' memories, and related to the value given to education and access to further studies. Again, association might be the reason for not naming 5CM *liceu*, hence 2RF, an older *liceu* building in Oporto, is located on the opposite side of the linking street, i.e., a conscious choice to name *liceu* the oldest and 'secondary school' the newest. Therefore, the preservation of the name was important, as the case of 6DM shows, which means that the word *liceu* is an intangible value that might need its tangible presence in the building to be preserved in memories.

School designation

Teachers and staff were asked which name they used when referring to the school (Q3), in order to identify if the word *liceu* was still in use. As an indicator of the importance of these buildings for generations of former students, teacher and staff, and of the attached elitist value (see Chapter Four), and indicator of the continuity of scribed values, four pre-defined options were provided, and a space for 'other'. Although considering that the name of the research, 'historic *liceus*' written in the questionnaire protocol might have biased participants' answers, the following Table 8.5 shows that participants from 5CM do not use the word *liceu* to identify their school.

Building types	Ecletic <i>liceus</i>		Modernist <i>liceus</i>		Estado Novo <i>liceus</i>		Total
	1PN	2RF	3DG	4FL	5CM	6DM	
Teachers	27%	10%	53%	31%	0	14%	27%
Staff	15%	25%	68%	10%	0	17%	15%
Total	21%	14%	61%	22%	0	16%	21%

Table 8.5. Results from Q.3: Which name do you use to identify this school? (% who choose *liceu*)

The investigation of the collective memory of schools' teachers and staff, after physical changes have taken place, show that the relationship with one of the elements of the place identity, its name, is still preserved by 25% of participants, with more than 10% in each group, in all schools. It should be highlighted that the percentages obtained in 3DG may reflect the importance of the institution in this regional context, where secondary education was not

accessible to all before the Democratic Revolution. This distinctive and symbolic character, regionally attached, was reported by 3DG-SD.

Surprisingly, there was no pattern found in the sub-groups of schools, i.e., the word *liceu* does not seem to be used more in the oldest Eclectic *liceus* rather than the more recent *Estado Novo liceus*.

Participation in rehabilitation process

Teachers considered that there was a missed opportunity in the lack of early consultation in the design and construction process. For example, one participant states that 'It was a pity that teachers were not consulted before the works' (2RFD).

One staff participant further refers to the lack of awareness regarding explanatory meetings about the project: 'I did not know that there has been a meeting'; participation, these participants say, 'would not be worth [it] because they wouldn't have changed anything' (1PNF). The same idea is expressed in 2RF, which further adds to the idea that what has been shown does not corresponded with what has been built – 'just visualised the projects that do not correspond to the rehabilitation' (2RFD), i.e., what was shown was not what was built.

Teachers and staff were asked about their involvement in the rehabilitation process. According to the owner, there was a meeting with the school community and the local community, where the rehabilitation and extension project was presented, which occurred before construction works started.

Spaces of social interaction

Interior circulation spaces give access to functional spaces and formal learning spaces. Current school models consider that these areas should be part of the new idea of an informal learning environment. It is therefore important to understand if these spaces now induce a different use, i.e., if they are currently used for social interaction. When referring to the schools before interventions, corridors were only mentioned in 5CM as 'cold corridors' [CM|A11|12], and in 4FL as 'dirty' [FL|A12|7]. After rehabilitation, school corridors and atriums were only mentioned by the youngest students of 4FL – the school that only has an interior patio and where students are not allowed to go outside. The expressions used to describe these spaces used adjectives such as 'long and wide corridors' [FL|A11, 12|7], and activities of space experience, such as 'walk in the corridors with my friends' [FL|A19, 22|7]. One student even stated that: 'my favourite place is the corridor' [FL|A24|7], emphasising the importance given to social interactions beyond the formal learning environments. In summary, young students in

4FL search for wide spaces to socialise and select the circulation areas, as this students explains: ‘the atrium is enormous and it is a good place to hang out’ [FL|A13|7].

The emphasis on the objective of the place, which is teaching and learning, is expressed in several students’ responses. This student expression synthesises clearly the main objective of rehabilitation interventions, i.e., academic achievement: ‘The best space to learn’ [DG|A07|7]

8.4. Reflections on the Recognition of the Value of Historic *Liceus* Rehabilitation

Rehabilitation of historic *liceus* is an opportunity to create the heritage values of tomorrow - a topic that should be of great interest to heritage policy. In Portugal, the strategic goal of the national heritage authority, (IGESPAR) to ‘enhance the listed heritage’, can have three interpretations: to enhance the values of listed heritage, enhance the physical condition of listed heritage, or enhance the number of listed properties. By discussing the recognition of rehabilitation interventions in historic *liceus* as an outcome of a process of change, this section can contribute to clarifying the effective meaning of this general goal. Departing from the discussion on the effect of rehabilitation design value at national level policy, the attitude at municipal level will be briefly considered as well as the international architectural heritage community’s feedback regarding the recognition, or not, of the value of rehabilitation design for historic *liceus*. The following outcomes of rehabilitation of historic *liceus* in the protection of architectural heritage are the following: heritage policy, heritage dissemination, and heritage public awareness.

8.4.1. State (IGESPAR)

The first interpretation, that IGESPAR aims to enhance the values of listed heritage, would mean that rehabilitation interventions in national heritage monuments – or in those in the process of becoming listed – would presumably have acknowledged the technical advice given. As none of these actions was found in that period (see Chapter Seven), the effect that rehabilitation could have is in the updating of the heritage listing processes and in their finalisation. So far (July 2013), six listing processes of historic *liceus* were successfully closed, with the listing as Monuments of Public Interest supported on a set of specific heritage values.

The analysis of the council text, which officially listed national architectural, in this period (before 2015) issued by the Secretary of State for Culture, is summarised in Table 8.6 below for this research's case studies.

CASE code	1 st inauguration	inauguration of rehabilitation interventions	Heritage Law no. 107/2001, 8 September: Article 17 - criteria for listing	a) The original character of the asset;	b) The genius of its creator;	c) The asset interest as a symbolic or religious witness;	d) The asset interest as a remarkable testimony of experiences or historical facts;	e) The aesthetic, technical or material intrinsic values of the asset;	f) The architectural, urban and landscape design;	g) The extension of the asset and what is reflected in the asset regarding the collective memory;	h) The historical or scientific research significance of the asset;	i) The circumstances which might involve decrease or loss of continuity or integrity of the asset.	other: antiquity, authenticity, originality, rarity, singularity
OPM	1911	24.04.2010	MIP 12.07.2013	X	X			X	X	X			
1PN	1911	10.09.2010	MIP 20.11.2012 expired	X				X	X	X			
2RF	1932	01.09.2008	15.10.2010										
3DG	1937	02.09.2011	MIP 29.04.2013	X				X	X	X			
4FL	1938	05.10.2010	MIP 20.11.2012 closed		X			X	X			X	
5CM	1951	30.01.2011	02.05.2008										
6DM	1948	05.10.2010											

Table 8.6. Criteria used for listing historic *liceus*, in Heritage Law no. 107/2011.

First it indicates that the two criteria most used for the listing of historic *liceus* were: 'the intrinsic values of the asset', and 'the architectural and urban design concept'. The 'original character of the asset' and 'the extension of the asset and the collective memory' is not recognised in 4FL, although it is the only one which refers to the 'circumstances which might involve decrease or loss of continuity or integrity of the asset'. Surprisingly, following the findings of the previous chapters, 'the genius of its creator' is only referred to in OPM and 4FL. These facts suggest different values assessments according to the official in charge of the significance evaluation. The same inconsistency was found in two of the five case studies that have on-line records, updated after interventions: one very briefly mentions the interventions and the other does not include any reference. Therefore, the national heritage authority seems not to value the rehabilitation that took place in historic *liceus*. Furthermore, the special protection areas established around the listed *liceus* also established different criteria. Firstly, in Eclectic *liceus*, listed as MIPs, only a list of significant elements is listed: in the case of OPM, issued in July 2013, almost three years after rehabilitation completion, the list includes the protection of 'gardens and orchards' that were already not in place in 2007; in case 1PN, the listing was issued in November 2012, two years after interventions, and the council protects the 'sports pavilion and cafeteria', which have had their interiors and their facade significantly

changed in the rehabilitation, even though with a potentially reversible system. As a result, while the first leaves out the area where the new extension was built, in 1PN this area is included, although in both no reference is made to the new buildings that have been built. The case of 2RF is still obscure, as the proposal for listing expired in October 2010, two years after the rehabilitation was completed, with no explanation found. Thirdly, Modernist *liceus* (3DG, 4FL), both in use after rehabilitation for two years, had the whole plot protected.

Reasons for these inconsistencies were not found, but reveal distinct approaches within the same institution and a disregard by the evaluation of rehabilitation. Finally, in terms of the third interpretation – that IGESPAR aims to enhance the number of listed properties – it became clear that, regarding historic *liceus*, *Estado Novo liceus* are not an option and 2RF, widely recognised as a work with an 'original character', which reflects 'the genius of its creator' and has a 'symbolic meaning', beside other values, is not considered significant at national level. Note that the proposal for listing this historic *liceu* came from the then IPPAR President himself in 2005, based on the importance of this architect's work for twentieth-century Portuguese architecture.

The first historic *liceus* to be listed were the Modernist *Liceu D. João III, Coimbra* (March 2010), under the same proposal of the IPPAR President regarding architects' relevant work, and the Eclectic *Liceu Alexandre Herculano* (January, 2011). Both are now in a significant degree of physical disrepair and are still operating as secondary schools. Although no project has been designed for the first, the second was included in SMP Phase 4 and has been waiting since 2011 to be addressed. These facts raise concerns on the possibility that listing might restrain interventions in historic *liceus*. Briefly returning to case 2RF, as the proposal for listing expired after rehabilitation had been finished: as the building was rehabilitated, is this an indicator that the conservation proposal was considered unsuitable yet carried out anyway, resulting in the IGESPAR's decision not to continue with the process, and in order not to justify its decision, let the proposal exceed its deadline for concluding the listing process? Or, most important for this research: was there a negative evaluation of conservation outcomes by IGESPAR? And if so, which criteria and methods were used to assess the actual, and not predictable, impact of the proposal in the cultural significance of the heritage asset? The study of IGESPAR's project appraisal records is not conclusive, and it is not in the scope of this research to further explore this issue.

State Inventory of National Architectural Heritage

IHRU is responsible for ensuring the implementation of the policy established by the government in the areas of housing and urban regeneration. The IRHU award for Urban Rehabilitation focuses on promoting the dissemination of good practices and the quality of interventions in the protection, restoration and regeneration of the built heritage. At a national level, in 2011, and among 21 candidates, 1PN was awarded the IRHU award for Urban Rehabilitation, in the category of isolated buildings. The jury comments valued the respect for the 'spatiality, materials and construction techniques, improving the health conditions, thermal, acoustic and luminescent comfort of spaces, in addition of an appropriate structural reinforcement'. The addition was 'valued for its functionality, its sober language, although with identity and a serene articulation with the pre-existing buildings and outdoor spaces'. The outdoor areas were valued for the promotion of 'great comfort and pleasantness'.²⁵

Strangely, however, the on-line record of 1PN, awarded a rehabilitation award by the IRHU in 2011, has not yet been updated, while OPM mentions the rehabilitation intervention, with a brief description of the changes made and refers to the conservation authors, including architects and structural engineers. It seems to be the first time that a reference to the engineers is made in the authorship field in architectural heritage inventory records, which reveals the value of this expertise in the accomplishment of a successful rehabilitation.

8.4.2. Local (Municipalities)

So far, the local heritage policies have not reflected any change as a result of interventions. However, two issues need to be acknowledged. Firstly, as the state is no longer listing *liceus* at national level, proposals are being sent to municipalities, which are invited to verify the local heritage value of the properties. This may indicate that the value given to architectural heritage is being mitigated. Municipalities in Portugal are known to have currently reduced their human resources, particularly in the heritage area. Therefore, the establishment of an accurate statement of significance to support a proposal for municipal listing will be quite difficult to achieve. Secondly, an architectural honourable mention in Lisbon Municipality Architecture Annual Prizes has been given to OPM by the Lisbon Municipality. These unique events do not reflect the value of the interventions being made in the whole country in historic schools.

²⁵ In http://www.portaldahabitacao.pt/pt/ihru/premios/premioihru/Fichas/2011_F02.html 2014.01.31

8.4.3. International Community

Architectural conservation awards use rehabilitation interventions as a resource for the dissemination of best practices. The current most prestigious conservation awards are of a non-cash nature and consist in assigning value to the selected works through commemorative plaques to be fixed in the awarded buildings and to be unveiled in a local ceremony in the presence of heritage authorities, the building community, the local community, and all those interested in cultural heritage and its conservation. These ceremonies are aimed at drawing public attention to the importance of adequate protection of cultural heritage and therefore promote conservation best practices.

At the international level, in 2013, the international heritage community awarded the European Union Prize for Cultural Heritage/Europa Nostra Awards – category of conservation, enhancement and adaptation to new uses of cultural heritage – to OPM. Selected among 200 projects submitted from 16 countries, OPM's award was one of the fifteen awards given in the category of conservation. In the appraisal of the work, the refurbishment and reuse of historic elements was valued with original furniture retained in a creative adaptation to future needs (Europa Nostra, 2013). Furthermore, the education community also positively evaluated the interventions, by selecting OPM to be integrated in the 'Compendium of Exemplary Educational Facilities' (OECD/CELE, 2011b), where the challenges facing school building rehabilitation were addressed (Heitor, 2011), and OPM was presented as an example of a rehabilitation design in historic schools (Mestre and Aleixo, 2011a). As an investment, OPM is included in the Database of Best Practices in Educational Facilities Investment of the European Investment Bank (OECD/CELE and EIB, 2011). The purpose of this reference is to provide a comparison on what is being valued in the national context and what is valued in the international context. It becomes clear that other factors may be influencing the appraisal of the value of the rehabilitation of historic schools in Portugal.

8.4.4. Public and Research.

Interventions in historic *liceus* can be used as a resource for involving the public in sustaining their heritage and increasing general public awareness for the value of preserving and enhancing architectural heritage. For example, in September 2013 the event Open House Lisbon offered the opportunity to visit OPM. The number of visitors exceeded expectations. Former students, current students, neighbours and architecture students had a guided visit

and a direct experience of the rehabilitated facility. The interest in knowing and experiencing has been proved.

Finally, by generating new knowledge and discussing good practices, architectural rehabilitation is a source of knowledge and a relevant area for cultural heritage research. Recently, and due to the changes in the educational system in higher education, an increasing number of masters students have found in this programme a wide range of topics to study and several studies on conservation have been conducted using *liceus* as case studies, for example in architecture, engineering and sociology. However, the topics are still more focused on materials and techniques, construction stages, processes and physical monitoring of interventions. Consequently, the relationship between material change and immaterial values is still under-researched.

8.5. Revising the ERECS Tool 3rd Stage: Outputs and Outcomes of Rehabilitation

The third stage of the conceptual framework ERECS was used for the assessment of change in the cultural values of the six cases studies, in order to establish the effect of architectural rehabilitation on the material and immaterial cultural values and to understand change in historic *liceus*' significance. Similar to the initial stage, ERECS uses an holistic evaluation of cultural values of historic *liceus* after interventions, in this stage of the tool conducted one year after interventions completion, establishing historic and contemporary values, material and immaterial cultural values, recognised and used values, framed by the current condition, and the integrity and authenticity of places. Data on these categories were found by surveying the site, by comparative analysis of design documents, by inquiring the historic setting users, and finally by analysing official heritage listing documents. Following the gathering of qualitative data, an interpretative analysis and a contextual content analysis were conducted.

This brief summary of the use of the tool at this stage found that the assessment of short-term effects on historic *liceus*' physical attributes is positive as it has generally preserved the places' character and added a new identity without mitigating the historic, as well as having enhanced the physical condition and preserved the places' authenticity and integrity.

The significance of rehabilitated *liceus*' historic values was preserved – location, landscape and architectural image – and new contemporary values were found in the new design – comfort and technology which help to update teaching methods and capture students' interest (Willis, 1992).

Rehabilitation of the *liceu* buildings has respected and preserved the artistic and construction systems of the original work and used contemporary materials and technique in additions and extensions, complying with international recommendations. The original spatial-functional layout was generally preserved, with the maintenance of the identity spaces in their original location – classrooms, libraries, gymnasiums, laboratories, administration – preserving the original circulation circuit of the stairs and corridors, which preserve the previous experience of space use.

8.5.1. Reflections on the Conceptual Framework and Methods

The framework and the process of analysis established in ERECS have proved to be useful in the assessment of values, design strategies, and change in the cultural values of the six case studies. However, some adjustments should be done. Questions should be asked more directly to reduce the need for the researcher to interpret responses, even acknowledging that this method would not provide as rich data as the method here used. For example, in the acrostics, as the researcher did not talk to students, there might have been some bias from teachers. In these cases, direct questions would provide more clear data.

Several challenges emerged from the analysis of intangible values. The evaluations of feelings, opinions and memories of stakeholders revealed how quickly values change. An example was found that reflected changes in governance. In the last case, 3DG, where data was gathered, the opinion that SMP has been a 'luxury' was more evident than in the previous cases, conducted before the elections. However, this fact stresses the need to conduct assessments with social data more frequently.

The historical value of the rehabilitation interventions needs time to be assessed. This was observed by teachers in 1PN who wrote that 'it is too soon to have the perception and the knowledge of the use of the facilities' and another who wrote that 'there is not much time of use'. These clear perceptions that it is time that enables users to value places is the exact reason why it is necessary to gather knowledge on perceptions as soon as possible, which may mitigate the development of negative effects as soon as they are identified. At this stage, one year after completion, the assessment is mostly restricted to material cultural values:

identifying if a contemporary architectural language has been used, if contemporary materials have been used, and if the functional-spatial layout corresponds to contemporary educational needs, technology and comfort. However, the social data gathered already indicate some effects that suggest a positive contribution to the sustainability of historic *liceus*.

8.6. Chapter Summary and Conclusions

The argument of this chapter was that physical and socio-cultural change in rehabilitated historic *liceus* achieved the purpose of preserving and enhancing the cultural values of these heritage places of education while updating them to meet current educational needs, therefore adding value and contributing to its sustainability. The aim was to evaluate the short-term effects of architectural rehabilitation on the cultural significance of historic *liceus* at a post-construction stage, i.e. one year after construction was completed. The aim to establish the outputs and the outcomes of the implementation of design strategies further intend to establish a link between the evaluated short-term results and the design strategies applied in the architectural rehabilitation of these examples of architectural heritage of education.

Beyond identifying the direct outputs and outcomes of rehabilitation, the short-term effects of these interventions were analysed as having created the heritage values of tomorrow.

Finally, the effect of changed material and immaterial values on the historic value was found to be positive as generally interventions did not diminish the existing historic evidence and the additional values of the twenty-first century have the potential to be valued in the future for having given the opportunity for these places to be preserved in use for years to come.

Design strategies to change historic *liceus*' setting aimed to prevent changes in views from the public realm. The key views of the main facade were preserved, and the main facade itself, its colours, window frames and details were retained and enhanced. In general, additions were located where temporary buildings were previously sited, using the same scale of the historic buildings, constructing with contemporary materials and using different colours. Historic *liceus* have now clearly designed outdoor areas for specific activities, which seem to indicate that, not considering fenced/enclosed sports pitches, parking areas, traffic and pedestrian paths, the remaining informal space for social interaction and for students' discovery and/or appropriation has been reduced. It can be concluded that historic values which have

characterised public *liceus*' settings as a heritage landmark in the townscape have prevailed over contemporary architecture.

The chapter findings contribute to knowledge on actual architectural heritage conservation effects by exploring cultural significance change in rehabilitation interventions. The findings further inform practice and decision-makers in an under-researched area – the link between design decisions and results.

The chapter concludes that the short-term effects of architectural interventions on cultural value attributes have, so far, contributed successfully to the sustainability of built heritage significance. Therefore, two conclusions can be drawn:

1. The design strategies applied were successful
2. The following attributes were found to be important in the socio-cultural sustainability of the cultural significance of historic *liceus*:
 - Technology
 - Comfort
 - Outdoor spaces
 - Sense of Place

The physical characteristics of rehabilitated *liceus* generally result from the functional and material changes of the outdoor spaces, to the building's overall mass, unchanged main facade, changed interior functional and spatial organisation, addition of new materials and of technology for health & comfort, and finally to changes in FF&C.

The changes made to adapt to new functional and spatial requirements followed some general conservation guidelines. The resulting architectural value, as discussed in Chapter Seven, is the addition of a contemporary layer in an historic context. The current identity of rehabilitated *liceus* is therefore the result of the current character of the place, reflected in the design of the outside spaces, in the adaptation of historic buildings, and in the architecture of new extensions and/or additions. In general, design strategies:

- Preserved and enhanced (historic) material cultural values;
- Updated historic environments to contemporary socio-cultural values and use needs;
- Had no major adverse effects on pre-existing values;
- Benefitted cultural heritage, as it retained the places' significance, and enhanced existing material values and historic spaces by added new contemporary architecture.

The effects of rehabilitation design at the national and local policy level was very different from the international architectural heritage community, which valued the interventions of rehabilitation of historic *liceus*, as architectural heritage, as education facilities and as financial investments. Overall, the observed omission of any reference to the recent works in the other six cases in the IGESPAR records suggests that IGESPAR does not consider the interventions to have enhanced the cultural significance of *liceus*, even though 13 historic *liceus* have been intervened in so far (2013).

In summary, the ERECS tool was found to be effective in establishing the change of material and indicative of immaterial cultural values of each historic *liceu*, at a short-term evaluation, providing relevant information for the maintenance of the physical condition, authenticity and integrity of the rehabilitated *liceus*. The test of the tool in six historic *liceus* enabled the researcher to establish patterns of sensorial beneficial attributes for the social value of the places. Revision of the framework included the inclusion of an emerged category of physical values: 'technologic'. This framework facilitated the comparison of short-term effects of rehabilitation design strategies with initial cultural significance and the identification of change in material and immaterial values in rehabilitated *liceus*.

After this assessment one year after completion, and in full use, the ERECS proposes an assessment of mid-term effects (five years after completion) and an impact assessment (at ten years after completion). The scope of the present research ends at this stage, but in order to understand the impact of rehabilitation in historic *liceus* cultural values, it would be beneficial for the research to be conducted in the next two stages – a recommendation to be made at the end of this thesis.

Chapter Nine will conclude the thesis, and will consider the practical recommendations for heritage management which lead on from the findings that have been discussed in the evaluation of outputs/outcomes and lessons learned on the use of the ERECS tool. The contribution to knowledge that the research has made and areas for further study will also be examined.

9.1 Introduction

The purpose of the research was to study the contribution which architectural rehabilitation design has made towards sustaining the cultural significance of architectural heritage, focusing on historic school buildings – *liceus* – in Portugal. In an assessment conducted in a short-term period, i.e., one year after completion, the research provides evidence on the effect of architectural rehabilitation on the material cultural significance of historic *liceus*.

Therefore, section 9.2 discusses how the research objectives have been met and linked to the theoretical discussion developed in Chapters Two to Four. Concluding the chapter, the contribution of the research to knowledge is explained in section 9.3, some limitations of the study are acknowledged in section 9.4 and recommendations for further work are identified in section 9.5.

9.2. Research Findings

The purpose of the research was *to study the contribution which architectural rehabilitation design has made towards sustaining the cultural significance of architectural heritage, focusing on historic school buildings in Portugal*. The research provides evidence of the effects of architectural rehabilitation on the cultural significance of historic *liceus*, conceptualised as material and immaterial values, in order to evaluate the design contribution to sustain architectural heritage legacy for future generations.

The theoretical literature on this topic, in an international perspective and specifically in the context of Portugal, revealed a lack of studies which investigate the relationship between material results of architectural rehabilitation design strategies and immaterial outcomes. In order to provide new understanding on the first effects of rehabilitation, this research evaluated recently (2007-2010) rehabilitated Portuguese historic schools, and examined their design process and the change in their cultural values one year after completion. Collecting

data one year after the completion of the construction stage enabled the researcher to produce knowledge which can inform current rehabilitation design practice immediately, contributing to mitigating possible future problems, and to capture the unique moment of the first uses and experiences. Such data can then be compared with future data to be collected five and ten years after the rehabilitation interventions were completed, as suggested by the Theory of Change model (Weiss, 1995) to provide an understanding of the impact of rehabilitation on heritage values.

The study was divided into three parts: the first comprised a systematic and holistic review of the key literature on cultural significance, architectural heritage rehabilitation processes and cultural values change, concluding with the establishment of a theoretical framework for cultural significance change; the second part focused on the design of an evaluation tool, based on the conceptual framework and on a case-study strategy, considering the three main stages of an architectural rehabilitation process; finally the third part tested the tool and reflected on the results. Therefore, the research objectives established in Chapter One were addressed. The overall results of this study are now summarised and discussed, and the overall conclusion is now outlined.

9.2.1 Research Objective 1: Evaluation Framework for Change

To establish a theoretical framework on the cultural significance of a place, rehabilitation design strategies and cultural significance change from a review of the literature.

The review of the literature highlighted previous studies of heritage values and material culture, establishing that architecture is material culture which reflects, in its design options and strategies, the immaterial culture of the society in the context in which it is created. For this reason, rehabilitation interventions have the capacity to change material values of buildings settings, which then have the potential to make communities value architectural heritage as contributing to their attachment and belonging, to their well-being and their sense of place.

Therefore, an assessment framework on the effects of architectural rehabilitation requires the distinction between both types of values. In addition, as values are ascribed by people, and different stakeholders may value the same heritage asset differently, the assessment of cultural values requires the gathering of information, with appropriate tools, from different stakeholders. Finally, according to the Theory of Change, the impact of initiatives which aim to

affect communities, such as architectural rehabilitation, only takes place ten years after its implementation. Although the case of historic schools' rehabilitation have a social purpose – to provide environments that support change in traditional teaching and learning methods, to attract students to the school and ultimately to enhance academic outcomes – the architectural design process is just a small part of this process of change, as it is recognised that the physical environment affects their achievement. However, the focus of this research, on the impact of architectural rehabilitation on the values of material and immaterial values of historic *liceus*, follows an identical rationale: heritage impact, although possible to predict, can only be fully known and understood through a sequential assessment of material and immaterial effects conducted one, five and ten years after completion. This model enables the identification of critical issues for sustaining heritage values post-construction, for which mitigation actions can be immediately taken.

9.2.2 Research Objective 2: Theory of Change in Architectural Rehabilitation

To design a tool for architectural heritage rehabilitation practice which evaluates design effects on cultural significance.

A lack of research on outputs and outcomes of rehabilitation interventions in architectural heritage emerged from the literature review. The research focused on the issues where contribution to knowledge is most needed, supported by architectural heritage conservation theories, analysing the underlying assumptions that inform interventions. The objective of using a Theory of Change (Weiss, 1995) framework in the evaluation of outputs and outcomes is to respond to the question 'how can outputs/outcomes evaluation of architectural rehabilitation interventions contribute to knowledge on cultural significance change, and therefore inform practice and decision-makers?' In such a complex design process, the first stage was to establish outputs/outcome measures that indicate success in achieving the rehabilitation objectives. As a theory-based evaluation, an approach to change that started in the 1990s, "theories of change" that underlie rehabilitation interventions supported the development of the tool (Weiss, 1995). Architectural heritage rehabilitation principles, strategies and guidelines entail a theory of change based on a number of assumptions. In the present research, it is assumed that historic school buildings are appropriate units of analysis of cultural values on which to study outputs/outcomes of rehabilitation. Another example is the assumption that architects will provide a service that will lead to success preservation and

enhancement of cultural values, and that architectural rehabilitation will achieve the goal of preserving and enhancing the cultural values of historic *liceus*. Finally, it is assumed that there will be lessons to learn to be applied at later stages and that the process model can be updated. Therefore the research selected outcome-oriented data, selecting attributes based on values-based architectural conservation theory, and evidence to be gathered during fieldwork, which analysis can link in a coherent and logical way to the design process (Weiss, 1995).

9.2.3 Research Objective 3: ERECS of Historic *Liceus* in Portugal

To test the tool in rehabilitated historic liceus in Portugal.

Empirical findings of the analysis of the six cases studies demonstrated the complexity of the process of establishing cultural values as values change with time and change with valuers. The analysis of the cultural values recognised by heritage authorities in historic *liceus*, national (IGESPAR) or municipal (PDM), revealed a list of heritage values related to historic, architectural, and social themes, which have research potential. The analysis of architectural documents further revealed the importance of large-scale factors, such as townscape and landscape, and small-scale ones, such as furniture, fixtures and equipment in the heritage value of historic schools.

This range of values was further complemented by the cultural values as perceived by the targeted community, i.e., the school community. The analysis of in-depth semi-structured interviews with school directors illustrated the social value of the historic place of education for generations of families, of students, teachers and staff. Simultaneously, the self-completion questionnaire with staff and teachers valued most the historical importance of the *liceu* at the national level, the design quality of the building and of its architect, and the identity of the place, and its character. Finally, the self-administrated acrostic poem activity with the younger and older students attributed value to the educational function of the building, to some attributes of the space, and to the people in it. These three sources of value assessment have revealed a range of values which is of foremost importance to inform any decisions on physical change. The literature considers that, 'without understanding, conservation is blind and meaningless' (Clark, 2001, p. 8), for which a values assessment framework was set out for the case of historic schools.

The recognition of the heritage values of all six cases by their users did not match the state's evaluation of the heritage values of these places. The identification of strong place attachment

to *liceus*, found in a generational legacy left from grandparents to parents and to children, seems to have been further cultivated by staff and teachers, and by their interest in the history of the place. The definitions of place attachment and place identity (Chapter Two) of current users were found to have a major role in the immaterial cultural significance of places, not considered in the state appraisal of architectural heritage values. In summary, the cultural values recognised and used before interventions were townscape value, landscape value, architectural value and values related to place use. Generally, however, even recognising *liceus* values, an emphasis was made regarding the physical conditions and pathologies/problems of buildings, which nevertheless were not referred to as impeding the fulfilment of the current curricula. This objective was achieved in Chapter Six.

The research objective of Chapter Seven was to understand current rehabilitation practices and intervention methodologies by taking a relevant snapshot and capturing indicators of ethics and professional expertise. The role of cultural values in architectural rehabilitation design strategies applied to the rehabilitation of historic *liceus* was assessed. Although it was assumed that a dilemma would be found, between the fulfilment of an educational brief and the provision of new education environments within an historic environment, the research found that architects prioritised the rehabilitation of historic fabric in regard to the provision of twenty-first-century learning environments. The spatial flexibility required by the new education paradigm was assumed in architects' discourses not be possible in purposely built *liceus* from the first half of the twentieth century, for which new spaces and technical requirements were generally located in new additions to the existing buildings. However, this was not a constraint to the proposal of new fixtures, finishes and equipment in the historic buildings, nor to the change of function of some spaces.

The analysis of in-depth semi-structured interviews with rehabilitation decision-makers, the owners and the architects, cross-referenced with their written documents and the architectural analysis of the architectural proposals found that adaptability, respecting the existing fabric, was the 'motto' followed by Portuguese architects. Historic buildings were generally respected regarding their authenticity and integrity, according to design strategies that give preference to architectural heritage approaches rather than to functional school architecture, although architects were not explicit about this. In the design strategies applied in historic *liceus*, cultural values that were recognised and used are generally material values, with some attitudes revealing a social objective.

The discussion of findings within heritage rehabilitation principles and architects' professional ethics has shown how architectural rehabilitation practice is currently being conducted in Portugal. It seems that the procedures undertaken for interventions in existing buildings or in the design of new buildings follow identical attitudes of respect. However, and contradicting international recommendations, the decisions on rehabilitation interventions on historic *liceus* relied on the architect alone, and on his/her experience, skills, training and practice. As the experience of architectural rehabilitation in Portugal is recent, as the explosion of construction lasted almost until the 2008 crisis, the same ethical procedures are being applied to new buildings as well as to interventions in historic buildings. The research found that, although the aim of PE was to commission historic *liceus* from architects with experience in rehabilitation, such was generally not the case, as confirmed by the architects themselves. In these cases, strategies applied were not supported on heritage rehabilitation principles or guidelines, although in their discourse the perception of the cultural value of material heritage is underlined in the options taken for their preservation and safeguard.

The research objective of Chapter Eight was to evaluate the short-term effects of architectural rehabilitation on the cultural significance of historic *liceus* at the post-construction stage, i.e., one year after construction. Based on a comparison made with the cultural values recognised and used before interventions, architectural rehabilitation has generally preserved material heritage values, and provided new learning environments to which new architectural and use values have already been ascribed by teachers. Students seemed to indicate an enhanced attachment to their school, while teachers and staff showed a high degree of satisfaction with the results of the interventions. The 'contemporary layer', the new uses and spaces, did not detract from the existing historic built environment, neither in the location of new additions or in their expression, preserving the townscape and enhancing the landscape values. Flexibility of twenty-first-century learning environments relies not on a traditional physical flexibility but on a mental flexibility. The provision of different environments for teaching and learning gives teachers and students the opportunity to embrace change and not be constrained by a rigid historic educational environment. Therefore, it has the potential to contribute to the establishment of a stronger bond between place and people, contributing to the immaterial values of historic *liceus*.

The analysis of the narrative discourse adopted by each interviewee – owner representatives, schools directors and architects – when asked to describe chronologically the rehabilitation process highlighted that each group of stakeholders considered different values. For the owner, the neglect given to school facilities was sending a misleading message on the value

given by the State to Education and the SMP enabled this opinion to change, and enabled this value to be enhanced. For architects, it was an opportunity to work in architectural rehabilitation and a cautious approach to existing values was taken. Finally, for school directors, it was an opportunity to enhance the work environment, and in some cases, to raise the awareness for the values of the building *liceu*, such as about their creator, the architectural style, and to rank the values of the functional spaces with most historic significance in the life of the school.

Although the assessment was considered to be conducted too early by some participants, new behaviours were already perceived by students, as they reported schools to be 'clean', perhaps demonstrating better care by the students, or the provision of better maintenance. A change in teachers' behaviour has also been found, namely with the acceptance of different management procedures regarding the adapted and extended current physical reality, indicating that buildings can shape attitudes.

9.2.4 Research Objective 4: Continuity in Cultural Change

To draw conclusions on the effectiveness of the tool in identifying short-term effects of rehabilitation on cultural significance.

The study found that, generally, architectural rehabilitation of historic Portuguese *liceus* preserved and enhanced material cultural values such as setting, townscape and landscape values; respected and preserved the historic architectural value by applying the principle of minimal intervention; and added contemporary architectural values. Conceptualised as material and immaterial, at this draft stage, the assessment of immaterial cultural values was not yet as clear as the physical change. The assessment of socio-cultural outcomes revealed a significant degree of satisfaction and a feeling of well-being, and the students expressed a sense of place attachment and place dependence. The sense of continuity is present, although the sense of community was not so evident.

9.2.5 Overall Conclusion

This thesis entailed a comprehensive review of the literature on values-based approaches to architectural conservation, providing attributes to be evaluated and types of change to be

assessed. This research approach, theory-based and evidence-based, joined architectural conservation theory and practice with the aim to evaluate actual effects. By combining theory and practice, the research's overall conclusion was achieved: architectural rehabilitation of historic *liceus* has contributed to the preservation and enhancement of material cultural values. However, these attributes must be sustained by care, attention and recognition of historic *liceus'* values, which are beyond rehabilitation interventions. At a short-term assessment, one year post-construction, some attitudes and behaviours have already changed. However, without the raising of awareness of users, as the heritage community, for the importance of maintenance and care for historic rehabilitated places, without their responsibility, following the recommendations of the *Faro Framework Convention* (Council of Europe, 2005), the sustainability of architectural heritage cannot be granted only by its material safeguard.

Architectural rehabilitation design strategies contributed to sustaining the material cultural significance of historic *liceus* in Portugal. However, the degree of such success seems to have been mitigated by not considering a values-based approach and a full participative process, i.e., by not considering the immaterial values in place properly. Although there is a feeling that a positive contribution could have been given by the school community, at this moment, the effects of the chosen mode of participation seem not to have negatively affected the heritage community's attachment to place. However, it is not possible to assess how this would have made a difference regarding the recognition and use of heritage values.

9.3 Contribution to Knowledge

One of the most important contributions made by this research to the studies, policy and practice of architectural rehabilitation is the draft tool ERECS, which links for the first time theory and evidence in the assessment of actual effects of architectural rehabilitation on places, i.e., on settings and people. The research joined knowledge from different sources, including own practice knowledge, to inform the best design of the tool. The research therefore established a theoretical framework that has not been applied in architectural conservation, linking theory on architectural conservation as a trigger for change, and evidence from fieldwork.

This thesis argues that architectural rehabilitation may contribute to sustaining cultural significance by adding contemporary socio-cultural values to places. Therefore, the overall research objective of this study was to generate new knowledge within the field of architectural rehabilitation by analysing architectural design strategies and their effects on tangible and intangible cultural values. This thesis has found that architectural rehabilitation effects on tangible and intangible values can contribute to sustainable outcomes as a basis for achieving cultural sustainability of built heritage, which enables use and cultural needs to be met while not compromising the ability to meet those needs in the future. Motivation and inspiration for this research were found in the experience of conserving buildings and acknowledging this possibility.

Facilitating the physical rehabilitation of an historic building is vital to its continued existence, particularly in contexts where regular maintenance is lacking. Yet if the value of its architectural rehabilitation is not appreciated by the buildings' targeted stakeholders or its daily users, any such contribution will be worthless. This study is therefore premised upon the assumption that if the role of a building' users in the passing on of its heritage to future generations is not fully acknowledged through a holistic recognition of all its values, then the mere preservation of its fabric will be insufficient for ensuring the cultural sustainability of the said building. The acknowledgment of the rehabilitation process, and particularly architectural decisions, is crucial to the understanding of outcomes, changes in users' experiences and perceptions and behaviours, all of which arise as a direct result of physical change.

Through the development of a tool to assess differences in tangible and intangible cultural value over time through a holistic and diachronic evaluation of change in conservation interventions, a humble contribution to Heritage Impact Theory ((Pereira Roders and van Oers, 2012, ICOMOS, 2011, Vakhitova, Guthrie and Roders, 2011, Schofield, 2008, Jesus, 2008, Bond et al., 2004, Clark, 2001)) is achieved.

This research is expected to influence public policy by substantiating the importance of stakeholder engagement in the conservation process, as previously proposed by the architectural profession guidelines (Ordem dos Arquitectos, 2009, UIA, 2011, RIBA, 2005) and practitioners (for e.g. Moreno-Navarro, 2000). It will further inform decision makers in heritage projects – owners, architects and historians – about the need to pay adequate attention to existing values, not just tangible but also intangible, with particular attention paid to those values which are not passed on to future generations by physical artefacts but by attitudes and behaviours, for example respect, passing knowledge and care. This study provides evidence

that communities – teachers, staff and alumni in the case of schools – act as the interpreters of places through their experiences, and as such have an important role to play in the cultural sustainability of historic places of education.

The final contribution of the research is the transferability, or at least adaptability of its findings to buildings of the same era which share similar rehabilitation challenges. The present research focuses on Portugal's secondary education establishments built in the first half of the twentieth century, with most historic *liceus* now listed as national heritage buildings and their values recognised by the schools' communities, local communities and the wider heritage community. The selection of case studies was aimed at contributing to the future rehabilitation of historic buildings with similar characteristics, as the twentieth century has produced architectural buildings that share similar rehabilitation problems (ICOMOS ISC20C, 2011).

These ideas and assumptions were the result of limitations on time and resources and a choice had to be made among a series of assumptions underlined in rehabilitation theory. The narrowing to these questions was supported by early studies, architectural heritage theories, personal practice experience and on the research context, where evidence was most needed, as in an interview, the Secretary of State for Culture stated: 'there can be no state support to culture if there is no evidence' (Crespo, 2013).

9.4. Limitations of the research

This research was conducted in a period of economic challenges in Europe. The economic crisis of 2008 'caught' the SMP in its early stages and it influenced how people perceived the value of the interventions. This fact made it necessary to gather data within a short period of time so that it would be consistent and comparable, and the least influenced by political and economic factors.

Another limitation that was felt was the skill necessary to conduct qualitative analysis of the social data. As an architect, analysis of material culture required interpretation, however the researcher's practice-based knowledge, supported by theory, made the analysis enjoyable and productive. Gathered in a hurry in anticipation of political change on the horizon, the social data from the questionnaires and acrostics aimed for a range of information that would be

most appropriate for the narrow gap in the knowledge that this research would aim to fill. At this point, with clear objectives and the draft of a tool, the methods can be designed more accurately, and a focus more on the perceived, and supported by literature, effects of rehabilitation for the socio-cultural values that most support the sustainability of architectural heritage.

This context, and management issues, reduced the possibility of conducting walkthroughs with former students in the cases to capture their perception of the change in the building environments and to gather their perceptions regarding change in immaterial values.

Another limitation of the research during the fieldwork is related to the mode of gathering information among students. As individual permission by each parent would be required for the researcher to conduct the research directly with students, the data-gathering method might have influenced responses. Although it could be argued that questionnaires sent by post are also collected without direct contact with participants, the presence of the researcher would guarantee that all data was not biased by the teachers' personal opinions or any other event. Finally, this study has only studied the first stage where only short-term effects can be evaluated. The time constraints of a PhD project did not make any wider scope feasible.

9.5. Recommendations for Further Study

More information on the 'true impact of design decisions' (Lawson, 2006, p. 81) is needed for practice, theory and policy. This tool is a work in progress although it is hoped that it will be used in three periods after the completion of the interventions, and is therefore open to other rehabilitation architects' experiences in similar situations. The aim now is that the method and approaches developed in this evaluation tool can be tested in other situations so it can be improved with the outcomes of other experiences. It would also be important to include those who are in a heritage management position so that any proposed changes arising from the evaluation could be implemented at the cultural policy level.

According to the previous limitations, some areas of research were established. Understanding the values ascribed by former students can inform on the most identifying elements of these public facilities. A study on the perception of change in rehabilitated *liceus* may provide

relevant information regarding the elements of continuity in this building typology, if they are recognised regardless of the rehabilitation interventions made.

The assessment framework was only applied in historic schools. However, it would be interesting to compare the results with an assessment of rehabilitation of pavilion-type schools from the 1980s in Portugal to understand the existing values and their role in architectural rehabilitation strategies.

Finally, replication of this research in five and ten years' time – a longitudinal study – would provide comparative data and a holistic understanding of the impact of architectural rehabilitation on cultural significance.

In summary, the study of cultural significance and contemporary architectural rehabilitation, particularly in Portugal, seems to offer several areas of research. This research in itself could be further explored by amplifying its scope but particularly by continuing the study of effects, by assessing the same sites within five and within ten years of the rehabilitation works being completed, and thereby establish the overall impact of architectural rehabilitation on the cultural significance of historic *liceus*. Such continuing study could provide insights into this current and significant research topic.

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Semi-structured Interviews: Protocol to guide conversations with

Schools Directors/representatives (SD)

Architects of rehabilitation projects and Design Team leader (Arch)

Agency: Former Ministry of Education and PE directors (ME, DD, BAD)

Participation Information sheet: Teachers/Staff Survey Questionnaire [EN]

Questionnaires (1PN): Teachers Survey Questionnaire Protocol (EN)

Acrostic Poems: Protocol (EN)

Fieldwork summaries: Table of Surveys

Tools, data sources, protocols and fieldwork data collection dates

Participants

Case Studies Timeline

Architecture data: *Liceu* building 1PN [Survey, 2007 | Rehabilitation, 2011] (esc. 1/2500)

Architecture: Level Plans

Architecture and Functions: Level Plans

Functional-Spatial Diagrams

SEMI-STRUCTURED INTERVIEW

School Director [or representative of School Direction]

(Give the information sheet and ask to read it as well as the consent sheet. If agree, ask to sign the later. Ask permission to turn on the tape recorder. Turn it on, prepare to take notes and start presenting the purpose of this meeting)

(Say name of interviewee) Thank you for receiving me here in your school today (say date), to have a conversation about my research on historic school buildings rehabilitation. After having collected opinions from this school from teachers and staff through a questionnaire survey, for which I again thank you, and having visited the building, I would like to have a conversation with you about three topics. I would appreciate it if you could share with me your perspective and give me some feedback on these issues. I don't have structured questions to ask you. I have themes to discuss which I think will be the most appropriate way to talk about the subjects that I am interested in, such as your personal experience of participating in the adaptation of a historic school building to support your educational curriculum. Furthermore, we have discussed some of these questions before, during my first visit in April, so I might ask you to go back to some of them and please repeat some issues again.

Therefore, the topics of conversation address the rehabilitation process, considering its three stages:

1. Before: what was the school building like before the programme arrived? What was the value of the school? What was the building like, from a physical and functional perspective? What were the physical problems/needs?

2. During: the conservation process of design and construction; how was the process developed? How did the school explain what was necessary? How would you describe the relationships between *Parque Escolar*, the architect and the school? How did the school participated in the process? Was there participation from users? How? How did the educational community react to having to work under a construction atmosphere, and in fact 'inside' the construction site?

3. After: post-occupational reflection 1 year after full use; what is your final perception of this work that took one year of preparation and two years on-site? How has the final result been evaluated? Was there any impact on the values of the school? What were the gains and losses for the school? What is the feedback from students, staff, teachers and alumni? What lessons can be learned from this intervention? What could have been changed? Are you satisfied with the results?

As a **final question**, I would like you to take a 'virtual photograph' to send to someone very far away from here, e.g. for a relative in Australia, that can express better what the school was before and what the school is now, after rehabilitation. Could you please tell me from where would you take those two pictures?

Thank you very much for your time and for sharing your thoughts and insights related to this subject with me. The interview is over. During transcription I might need to send you some issues to be clarified by email; if you are happy with this, and then please be kind enough to reply to me. Thank you again.

SEMI-STRUCTURED INTERVIEW

Architect author of rehabilitation project and Design Team leader

(Give the information sheet and ask to read it as well as the consent sheet. If agree, ask to sign the later. Ask permission to turn on the tape recorder. Turn it on, prepare to take notes and start presenting the purpose of this meeting)

(Say name of interviewee) Thank you for receiving me here in your office today (say date), to have a conversation about my research on historic school buildings rehabilitation. Let me thank you for the documentation you sent, particularly the design schemes and descriptive memories of two of your projects, which I have selected as two of my six case studies. After having collected opinions from both schools and having visited the buildings, I would like to have a conversation with you about 3 topics related to the recent intervention of your office in these two historic school buildings. I would appreciate if you could share with me your perspective and give me some feedback on some issues. I don't have structured questions. I have themes to discuss which I think will be the most appropriate way to talk about the subjects that I am interested in, such as your perspective of this process as an architect and how you rehabilitate historic schools at the beginning of the 21st century in Portugal.

Therefore, my topics of conversation address the rehabilitation process, considering its 3 stages:

1. Before: what was the school building like when you first saw it? What were the values of the school building? What was your physical and functional assessment of the building? What were the problems? Could you compare both '*Liceus*'?

2. During: the conservation process design and construction; how was the process developed? How was the brief delivered and how did you address it? What information was available to help you understand the school building? How and where did you get that information? What were your design strategies as a contemporary architect, as a conservation architect and regarding the specific existing school buildings? How were the relationships between *Parque Escolar*, Architect and school? Was there participation from users? How? Was there any reaction from the educational community to the project? Could you compare both processes?

3. After: post-occupational reflection 1 year after full use; what is your final perception of this work that took 3 years of your professional life? How is the final result evaluated? Were there any impacts on the values of school? What were the gains and losses for the school and for architecture? What lessons can be learned from this intervention? What could have been changed? Did you receive any feedback? Are you satisfied with the results? Could you compare both '*Liceus*'?

As a **final question**, I would like you to take a 'virtual photograph' to send to someone very far away from here, for e.g. a relative in Australia, that can express better what the school was before and what the school is now, after rehabilitation. Could you please do that for both '*Liceus*', and tell me from where would you take those two pictures?

Thank you very much for your time and for sharing your thoughts and insights related to this subject with me. The interview is over. During transcription I might need to send you some issues to be clarified by email; if you are happy with this, then please be kind enough to reply to me. Thank you again.

SEMI-STRUCTURED INTERVIEW

Parque Escolar EPE: Agency representatives

(Give the information sheet and ask to read it as well as the consent sheet. If agree, ask to sign the later. Ask permission to turn on the tape recorder. Turn it on, prepare to take notes and start presenting the purpose of this meeting)

(Say name of interviewee) Thank you for receiving me here in your office today (say date), to have a conversation about my research on historic school buildings rehabilitation. Let me thank you for the documentation you sent, particularly the design schemes and descriptive memories of my selected six case study projects.

After having collected opinions from the schools, having visited the buildings, and having talked to the rehabilitation Architects, I would like to have a conversation with you about 3 topics related to the recent intervention of the Agency you represent, *Parque Escolar*, in 6 historic school buildings. I would appreciate if you could share with me your perspective and give me some feedback on some issues. I don't have structured questions. I have themes to discuss which I think will be the most appropriate way to talk about the subjects that I am interested in, such as your inside perspective of what a school is in the beginning of the 21st century in Portugal and how the historic school buildings were adapted to provide such learning environments.

Therefore, my topics of conversation address the rehabilitation process, considering its 3 stages and, whenever possible, I would like you to address my case studies:

1. Before: criteria for selection school national network; rehabilitation options; educational conceptual model and 'learning street'; open school to the community; values of historic buildings; physical condition of buildings; international school modernisation references; education project in each school; selection of rehabilitation architects.

2. During: the conservation process design and construction; how was the process developed? How was the brief developed? What was the guidance given to architects? Was there participation from users? How? What strategies were employed for the rehabilitation and extensions? How was the design process developed? Were there problems found during construction? Why? What were the consequences? What were the relationships like between *Parque Escolar*, the architect and the school? What was the process of obtaining planning permission in the municipality and from the national heritage institution like?

3. After: a post-occupational reflection 1 year after utilization; what is your perception of this work in these schools at the present moment? How have the final results been evaluated? Was there any impact on the values of the schools? Perception of results: what is the feedback from schools, architects, local communities, heritage and conservation entities? What were the gains and losses for the schools and for architecture? What lessons can be learned from these interventions? What could have been changed? Could you make a brief comparison of the outcomes of the rehabilitation interventions in the six '*Liceus*'?

As a **final question**, I would like you to take a 'virtual photograph' to send to someone very far away from here, e.g. for a relative in Australia, that can express better what the school was before and what the school is now, after rehabilitation. Could you please do that for the six case study '*Liceus*', and tell me from where would you take those two pictures?

Thank you very much for your time and for sharing your thoughts and insights related to this subject with me. The interview is over. During transcription I might need to send you some issues to be clarified by email; if you are happy with this, and then please be kind enough to reply to me. Thank you again.

SEMI-STRUCTURED INTERVIEW

Former Ministry of Education [2005 | 2009]

(Give the information sheet and ask to read it as well as the consent sheet. If agree, ask to sign the later. Ask permission to turn on the tape recorder. Turn it on, prepare to take notes and start presenting the purpose of this meeting)

(Say name of interviewee) Thank you for receiving me here in your office today (say date), to have a conversation about my research on historic school buildings rehabilitation. Let me thank you for the time you have made available.

After having collected opinions from the schools, having visited the buildings, and having talked to the rehabilitation architects, I would like to have a conversation with you about 3 topics related to the recent intervention of the Agency you represent, *Parque Escolar*, in 6 historic school buildings. I would appreciate it if you could share with me your perspective and give me some feedback on some issues. I don't have structured questions. I have themes to discuss which I think will be the most appropriate way to talk about the subjects that I am interested in, such as your inside perspective of what a school is in the beginning of the 21st century in Portugal and how historic school buildings were adapted to provide such learning environments.

Therefore, my topics of conversation address the rehabilitation process, considering its 3 stages and, whenever possible, I would like you to address my case studies:

1. Before: criteria for selection school national network; rehabilitation options; educational conceptual model and 'learning street'; open school to the community; values of historic buildings; physical condition of buildings; international school modernisation references; education project in each school; selection of rehabilitation architects.

2. During: the conservation process design and construction; how was the process developed? How was the brief developed? What was the guidance given to architects? Was there participation from users? How? What strategies were employed for the rehabilitation and extensions? How was the design process developed? Were there problems found during construction? Why? What were the consequences? What were the relationships like between *Parque Escolar*, the architect and the school? What was the process of obtaining planning permission in the municipality and from the national heritage institution like?

3. After: a post-occupational reflection 1 year after utilization; what is your perception of this work in these schools at the present moment? How have the final results been evaluated? Was there any impact on the values of the schools? Your perception of results and what is the feedback from schools, architects, local communities, heritage and conservation entities? What were the gains and losses for the schools and for architecture? What lessons can be learned from these interventions? What could have been changed? Could you make a brief comparison of the outcomes of the rehabilitation interventions in the six '*Liceus*'?

As a **final question**, I would like you to take a 'virtual photograph' to send to someone very far away from here, e.g. for a relative in Australia, that can express better what the school was before and what the school is now, after rehabilitation. Could you please do that for the six case study '*Liceus*', and tell me from where would you take those two pictures?

Thank you very much for your time and for sharing your thoughts and insights related to this subject with me. The interview is over. During transcription I might need to send you some issues to be clarified by email; if you are happy with this, and then please be kind enough to reply to me. Thank you again.

PARTICIPANT INFORMATION SHEET
(QUESTIONNAIRES to Users:
teachers|staff

Research Study: Portuguese Historic School Buildings Conservation: impact of adaptation to new Education needs on the heritage value

I, Cristina Sofia Aleixo, am conducting this study (funded by *Fundação de Ciência e Tecnologia*) as a doctoral student at Oxford Brookes University (UK), for my personal research, and I am inviting you to take part in it.

Before you decide whether or not to take part, please take time to read the following information carefully.

The **purpose of the research** is to understand the consequence of the recent adaptation of historic school buildings to new education needs, in terms of their heritage value. School buildings have recognised educational and social value. Historic schools have architectural, aesthetic, symbolic and historical values, i.e. heritage value. However, schools must now adapt to changes. They need to be updated through reuse and extensions. Historic buildings seem more vulnerable to these interventions as they have qualities and features that should be preserved. Therefore, questions will be addressed to key people in identified groups that were directly related to the adaptation of historic schools - owners/*Parque Escolar*, the design team and users (teachers, staff, alumni and local residents) – in order to assess these facilities at a pre and post intervention stage. Therefore, your participation as a **teacher|staff member**, will make a significant contribution to this research.

It is up to you to decide whether or not to **participate**. If you agree to take part in this research, I would be grateful if you could find the time to provide information for my study by filling in this **anonymous questionnaire** and returning it to me. You are still free to withdraw at any time and without giving a reason, and you can skip any questions you do not wish to answer. The questionnaire will include questions on your values and perceptions of the value of your historic school buildings, the adaptation of your school, your participation in the process, and how people use the facility, pre and post the adaptation work. It should not take you longer than 30 minutes to complete. The questionnaire should be delivered directly to me or to the board room and put in a specific sealed box that will be left there. I will be here to collect the questionnaires two days from today, at this same time. However, if for any reason, you cannot complete the questionnaire during this time, it would be very helpful to have your completed questionnaire returned to me one week from today, at this same time. You will be given this information sheet to keep and by completing and returning this questionnaire, you **consent** to participating in this research.

Although there will be no immediate benefit to you, your participation is expected to raise awareness of the relevance that built environment heritage might have in your life. In addition, the future dissemination of the outcomes of this study will provide a better understanding of the conservation of historic school buildings.

All information collected about you will be kept strictly confidential. If you require, personal identifiers will be used in the study in order to protect your confidentiality, and anonymous quotes will be used. Confidentiality, privacy and anonymity will be ensured in the collection, storage and publication of research material. All laptops and memory sticks will be security code encrypted and data will be stored safely to be returned to Oxford Brookes University for secure storage up to 5 years after completion of the field study to comply with the Data Protection Act in the UK. The data generated in the course of the research will be retained in accordance with the University's policy of Academic Integrity.

Enquires about this research project should be directed to the primary investigator, Cristina Sofia Aleixo (saleixo@brookes.ac.uk), or her supervisors: Dr. Nicholas Walliman (nwalliman@brookes.ac.uk), Dr. Aylin Orbasli (aorbasli@brookes.ac.uk) and Dr. Igea Troiani (itroiani@brookes.ac.uk)

If you would like to know the outcomes of this research, please ask the researcher for a summary report. This research will be published as a doctoral thesis for academic purposes once it is completed, and it will be preserved in Oxford Brookes University Library.

This research has been approved by the University Research Ethics Committee and by the Portuguese Ministry of Education.

If you have concerns about the research please contact the Chair of the University Research Ethics Committee on ethics@brookes.ac.uk.

Thank you for taking the time to read this information sheet.

Lisbon, (*day*) – (*month*) - 2011

Principal Investigator Cristina Sofia Aleixo

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Headington Campus, Gypsy Lane, Oxford, OX3 0BP, UK
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HISTORIC LICEUS REHABILITATION

Heritage impact in the adaptation to new education needs

[PhD investigation topic in Architecture, Oxford Brookes University | Investigator: Cristina Sofia Aleixo]

TEACHERS' SURVEY

EX-LICEU: PEDRO NUNES

distribution: 2011.06.02 [PN | D]

Thank you for agreeing to participate and for the time that you'll be spending filling in this **anonymous** questionnaire. Your participation is very important for this research. All your answers will be confidential.

This questionnaire aims to collect your opinion about the school building where you work, your evaluation before and after the rehabilitation works, your knowledge of the building as a user of it, and also your opinion about some of the behaviours of the students. Please answer it openly and honestly as there are no correct or incorrect answers.

Unless otherwise indicated, choose one option only and mark your answer with an X.

Q1. In which year did you start working at this school?.....

Q2. For how many consecutive years have you worked at this school? (please, include the current year)

☐ <5 ☐ 5-9 ☐ 10-14 ☐ 15-20 ☐ >20

Q3. Which of the following names do you use to identify this School?

☐ EB 3 with Secondary Education ☐ Secondary School with EB 3
☐ School ☐ Liceu
☐ Other(which?):.....

Q4. On average, how many hours per week do you work at the school?

☐ Less than 10 h. ☐ 10-19 h. ☐ 20-30 h. ☐ More than 40 hours

Q5. Considering the condition of the School before the intervention, what is your current satisfaction level with the space in which you work?

☐ very satisfied ☐ a little unsatisfied ☐ Don't know
☐ satisfied ☐ unsatisfied
☐ a little satisfied ☐ very unsatisfied

Q6. In general, do you consider that the rehabilitation intervention provided better conditions, physical and environmental, for teaching and learning?

☐ yes ☐ no ☐ don't know

Q6.1. Please, say why:.....

Q7. In general, do you consider that the rehabilitation intervention improved the (interior) circulation/access to spaces within the School?

☐ yes ☐ no ☐ don't know

Do you wish to comment?.....

Q8. Do you consider that the rehabilitation intervention organised and joined the curricular areas in a way that that allows the areas to function more efficiently?

☐ yes ☐ no ☐ don't know

Do you wish to comment?.....

Q9. Do you consider that the rehabilitation intervention improved environmental comfort in the spaces where you teach in the following aspects:

Q9.1. thermal comfort? ☐ yes ☐ no ☐ don't know

Q9.2. acoustic comfort? ☐ yes ☐ no ☐ don't know

Q9.3. air quality? ☐ yes ☐ no ☐ don't know

Q9.4. safety? ☐ yes ☐ no ☐ don't know

Q9.5. accessibility? ☐ yes ☐ no ☐ don't know

Do you wish to comment?.....

Q10. In your opinion, why was it decided to rehabilitate and extend the original school buildings from the Lyceum period instead of demolishing them and constructing a new building?

.....
.....

Q11. This decision brought changes to the existing buildings and existing exterior spaces:

Q11.1. Identify one positive change.....

Q11.2. Identify one negative change.....

Q12. Identify the characteristic of the School building that, currently:

Q12.1. you dislike the most.....

Q12.2. you like the most.....

Q12.3. is most unique in this School.....

Q13. Currently, do you feel that any elements of the school's identity have been lost?

☐ yes ☐ no ☐ don't know

Q13.1. If you answered 'yes', say which:.....

Q14.1/2. BEFORE the rehabilitation, what values did you ascribe to this school? (please select one option for each value, on the left hand side) And how would you evaluate these values **AFTER** the rehabilitation? (please select one option for each value, on the right hand side)

BEFORE the rehabilitation								AFTER the rehabilitation					
I absolutely agree	I agree	In some way, I agree	In some way, I disagree	I disagree	I absolutely disagree			VALUES ATTRIBUTED TO THE HISTORICAL SECONDARY SCHOOL BUILDING					
									Improved	Kept the same	Diminished	Lost this value	Don't know
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1. Architectural	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2. Cultural	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3. Historical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4. Social	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5. Educational	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Other: which?.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q15. After the rehabilitation, do you consider that any new value can be ascribed to this School?

☐ yes ☐ no ☐ don't know

Q15.1. If you answered 'yes', say which:.....

Q16. Are you aware of this School's historic-educational collection (Archives, Bibliographic, Scientific...)?

☐ yes ☐ no

Q16.1. If you answered 'yes', have you used it as an educational resource in your teaching?

☐ yes ☐ no

Q17. Have you used the building as an educational resource in your teaching?

☐ yes ☐ no

Q18. Did you participate in the meeting which took place before the works began, where the Rehabilitation and Extension Design Project was presented to the educational community?

☐ yes ☐ no

Q19. Do you feel that you have participated in the decisions regarding the works of the Rehabilitation and Extension Design Project of this School?

☐ yes ☐ no

Q19.1. If you answered 'no', say why:.....

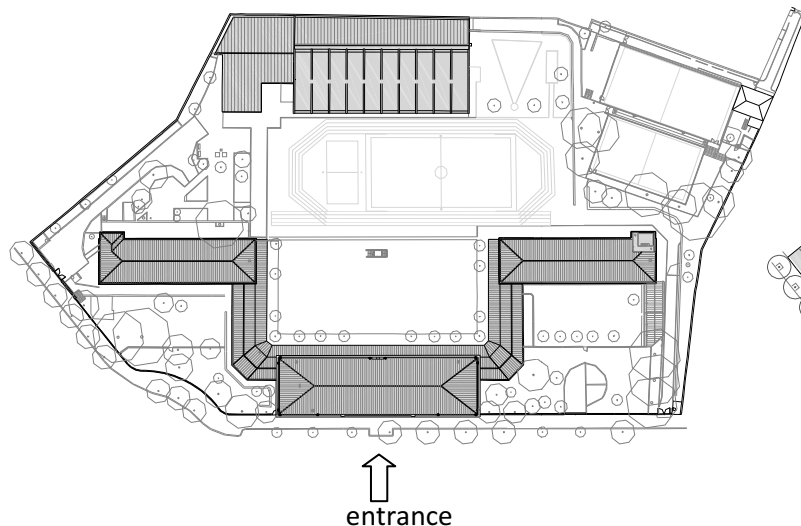
Q20. At the present moment, would you like to attend a session which would explain how to use the rehabilitated buildings and the new buildings?

☐ yes ☐ no ☐ I already did

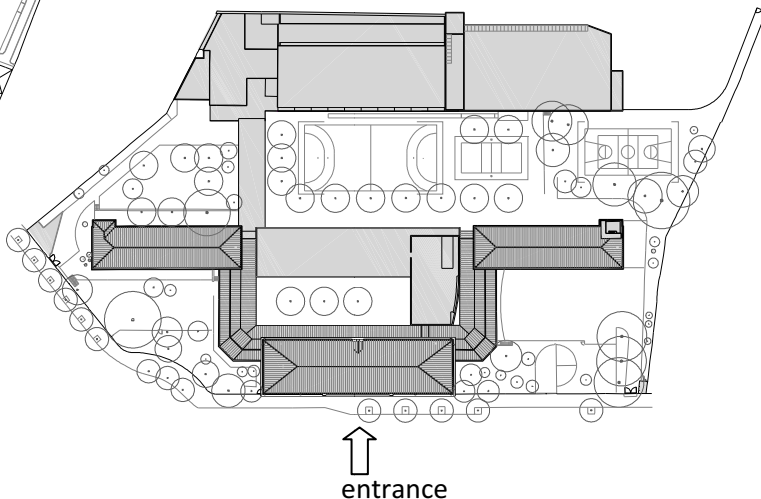
Q21. The following drawings represent the School plan **BEFORE and AFTER the Rehabilitation.** I am now going to ask you about **your perception** of how **STUDENTS** use the exterior spaces: (please draw **on the plans** with circles and numbers according to the **use**):

①. not much ②. regularly ③. Very much

BEFORE THE REHABILITATION



NOW



Q22. In your opinion, why do they use the zone you identified with a '3' more frequently?

.....

Q23. In your opinion, why do they use the zone you identified with a '1' less frequently?

.....

Q24. Do you consider that the current facilities of the School contribute to a better learning environment for the students?

☐ yes ☐ no ☐ don't know

Q24.1. If you answered 'yes', say in what way:.....

Q25. In your opinion, and considering the previous situation before the rehabilitation, do you think students now have more respect for and are more careful in their use of the facilities?

☐ yes ☐ no ☐ don't know

Personal Data

Q26. Age.....

Q27. Gender

☐ Female

☐ Male

Q28. Your academic background/level of studies.....

Q29. Your Department.....

Do you wish to add any comments?.....

.....

THIS QUESTIONNAIRE FINISHES HERE. **THANK YOU FOR YOUR CO-OPERATION**

Please, **do not forget to hand it back.**

REHABILITATION OF HISTORIC LYCEUMS

Heritage impact in the adaptation to new education needs

[PhD investigation theme, under research at Oxford Brookes University | Investigator: Cristina Sofia Aleixo]

STUDENTS' ACTIVITY

SCHOOL..... [..... | D]

Thank you for agreeing to participate and for the time that you will spend filling out this anonymous questionnaire.

Your participation is very important. All your answers will be treated confidentially.

You now use a School that was recently rehabilitated.

Bearing this in mind, complete these two **Acrostics**: (1)

My School is

S.....

C.....

H.....

O.....

O.....

L.....

My School was

L.....

y.....

C.....

E.....

U.....

M.....

(1) A text in which the initial letters of each line can be read down the page to spell a name or some other concealed message.

THANK YOU VERY MUCH for doing this activity.

Please, do not forget to hand it over.

Data Collected to analyze

SURVEY TOOLS

Fieldwork Site Survey: records to analyse [photographs, questionnaires, acrostics, audio, transcripts, notes]	total	1PN	2RF	3DG	4FL	5CM	6DM	1PN 3DG	2RF 5CM	4FL 6DM	Parque Escolar EPE
		Pedro Nunes (Lisboa)	Rodrigues de Freitas (Porto)	Diogo de Gouveia (Beja)	Filipa de Lencastre (Lisboa)	Carolina Michaelis (Porto)	Infanta D. Maria (Coimbra)	Pedro Botelho and Rosario Beija	Manuel Fernandes de Sá	[Joao Paulo Conceição] Manuel Gomes da Costa	
Survey Acrostic (students 7th grade) [1 page]	124	22	20	18	28	14	22				
Survey Acrostic (students 12th grade) [1 page]	102	18	17	2	28	18	19				
Survey questionnaire (Teachers/total) [4 pages]	88	15	20	19	13	14	7				
Survey questionnaire (non-Teachers/Total) [4 pages]	80	14	8	22	10	14	12				
Buildings survey [1 page/plan in each stage: origin, before, after]		design plans / photos / notes						audio	audio	audio	
Interview/conversation (Director or 1/x element of Direction Team) [1 page]	8	1/4 audio	3/5 audio	1/4 audio	1/5 audio	1/4 notes	1/4 audio				
Interview/conversation (Conservation Architect and Design Team leader) [1 page]	4										
Interview/conversation (1/4 Parque Escolar Administration) [1 page]	1										audio
Interview/conversation (Buildings Area director at the head office) [1 page]	1										audio
Interview/conversation (Former Minister of Education) [1 page]	1										audio
total participants	409	69	65	61	79	60	60				

note: 1/4 means 1 member of a group of 4 members of the Direction of the School

Survey questionnaire (Teachers/total) returned in hand to the researcher	10	11	19	8	11	2
Survey questionnaire (Teachers/total) returned by post	5	9	0	5	3	5
	15	20	19	13	14	7
Survey questionnaire (non-Teachers/Total) returned in hand to the researcher	8	2	22	7	6	5
Survey questionnaire (non-Teachers/Total) returned by post	6	6	0	3	8	7
	14	8	22	10	14	12

Stages to carry on [dates]

SURVEY TOOLS

	MIME (Ministry of Education) approval	Survey: Types of Documents	DATA SOURCES							protocol	DATA COLLECTION DATE											
			teachers	non-teachers	School Board	alumni	students	architects	Parque	buildings		1st visit to school	29-04-2011	07-04-2011	28-04-2011	30-04-2011	07-04-2011	07-04-2011	Case Studies			Parque Escolar EPE
												Pilot	1	2	3	4	5	6	1PN 3DG	2RF 5CM	4FL 6DM	
												Passos Manuel (Lisboa)	Pedro Nunes (Lisboa)	Rodrigues de Freitas (Porto)	Diogo de Gouveia (Beja)	Filipa de Lencastre (Lisboa)	Carolina Michaelis (Porto)	Infanta D. Maria (Coimbra)	Pedro Botelho and Rosario Beija	Manuel Fernandes de Sá	[João Paulo Conceição] Manuel Gomes da Costa	
DATA TO BE ANALYSED	yes	Survey self-completion questionnaire (Teachers)	x								semi-open	22-03-2011	02-06-2011	01-06-2011	11-04-2012	03-06-2011	31-05-2011	31-05-2011				
		Survey self-completion questionnaire (non-Teachers)	x								semi-open	22-03-2011	02-06-2011	01-06-2011	11-04-2012	03-06-2011	31-05-2011	31-05-2011				
		Interview/conversation (School Direction Team)		x							schedule		03-10-2011	05-01-2012	12-04-2012	01-10-2011	28-09-2011	30-09-2011				
		Interview/conversation (former Minister of Education)			x				x		schedule											10-01-2012
		Interview/conversation (1/4 Parque Escolar Administration)							x		schedule											06-01-2012
		Interview/conversation (Buildings Area director at the head office)							x		schedule											02-10-2011
		Interview/conversation (Conservation Architect and Design Team leader)					x				schedule	30-09-2011							29-09-2011	28-09-2011	03-01-2012	
		Survey of settings: building and outdoor areas (before academic year starts)							x		plans/facades	06-04-2011	09-09-2011	07-09-2011	12-09-2011	02-09-2011	07-09-2011	22-08-2011				
	yes	Survey self-completion Acrostic Poem (students 7th grade)					x				acrostic		02-06-2011	01-06-2011	11-04-2012	27-04-2011	25-05-2011	08-06-2011				
		Survey self-completion Acrostic Poem (students 12th grade)											02-06-2011	01-06-2011	11-04-2012	24-05-2011	25-05-2011	31-05-2011				
HANDOUT		Participants Information sheet (questionnaires)	x	x							info	22-03-2011	handed out	handed out	handed out	handed out	handed out	handed out				
		Participants Information sheet (interviews)			x		x	x			info		handed out	handed out	handed out	handed out	handed out	handed out	handed out	handed out	handed out	handed out
		Interviews Consent Form (signed and kept)			x	x	x	x			form		03-10-2011		12-04-2012	01-10-2011	28-09-2011	30-09-2011	29-09-2011	28-09-2011	03-01-2012	02-10-2011
		Poster announcing survey day (sent one week in advance)							x		poster	22-03-2011	sent	sent	sent	sent	sent	sent				

CASE STUDIES TIMELINE					SETTINGS		
					<div><div></div>TEMPORARY PAVILIONS</div> <div><div></div>DEMOLITIONS</div> <div><div></div>ADDITIONS</div> <div><div></div>MAIN ENTRANCE</div>		
LICEU PASSOS MANUEL							
<div>Liceu [mixed school] author Owner</div> <div>JOSÉ LUIZ MONTEIRO (1848-1942) Kingdom Ministry</div> <div>RAPHAEL da SILVA e CASTRO (18xx-19xx)</div> <div>ROSENDO CARVALHEIRA (1864-1919)</div> <div>Liceu Rehabilitation [2/3B] author</div> <div>project188218871888189619071882188708-011911</div> <div>work started</div> <div>inauguration</div> <div>ARCH 0VICTOR MESTRE (1957-) SOFIA ALEIXO (1967-)</div> <div>2007200825-042010</div>					<div>1911</div> <div>2007</div> <div>2011</div>		
LICEU de PEDRO NUNES							
<div>Liceu [mixed school] author Owner</div> <div>MIGUEL VENTURA TERRA (1866-1919) Kingdom Ministry</div> <div>JORGE SEGURADO (1898-1990) MIP-JAESS [SPORTS PAV.]</div> <div>Liceu Rehabilitation [3B + S] author</div> <div>project19081957190919111961</div> <div>work started</div> <div>inauguration</div> <div>ARCH 1PEDRO VIANA BOTELHO (1948-) M. ROSÁRIO BEIJA (1951-)</div> <div>2007200810-092010</div>					<div>1911</div> <div>2007</div> <div>2011</div>		
LICEU RODRIGUES de FREITAS							
<div>Liceu [boy's school] author Owner</div> <div>JOSÉ MARQUES da SILVA (1869-1947) Kingdom Ministry</div> <div>Liceu Rehabilitation [2/3B + S] author</div> <div>project(1914)191819271932</div> <div>work started</div> <div>inauguration</div> <div>ARCH 2MANUEL FERNANDES de SÁ (1943-)</div> <div>2007200801-092008</div>					<div>1932</div> <div>2007</div> <div>2011</div>		
LICEU DIOGO de GOUVEIA							
<div>Liceu [boy's school] author Owner</div> <div>LUÍS CRISTINO da SILVA (1896-1976) MIP-JAESS</div> <div>Liceu Rehabilitation [3B + S] author</div> <div>project1929193120-061936</div> <div>work started</div> <div>inauguration</div> <div>ARCH 1PEDRO VIANA BOTELHO (1948-) M. ROSÁRIO BEIJA (1951-)</div> <div>2008200915-022011</div>					<div>1936</div> <div>2008</div> <div>2012</div>		
LICEU D. FILIPA de LENCASTRE							
<div>Liceu [girl's school] author Owner</div> <div>JORGE de ALMEIDA SEGURADO (1898-1990) MIP-JAESS</div> <div>ANTÓNIO VARELA (1902-1963) JCETS [ADDITION]</div> <div>Liceu Rehabilitation [2/3B + S] author</div> <div>project1932195919371938</div> <div>work started</div> <div>inauguration</div> <div>ARCH 3JOÃO PAULO CONCEIÇÃO (1950-2011)</div> <div>2007200805-102010</div>					<div>1940</div> <div>2007</div> <div>2011</div>		
LICEU CAROLINA MICHAELIS							
<div>Liceu [girl's school] author Owner</div> <div>JANUÁRIO GODINHO (1910-1990) DGCE</div> <div>JOSÉ SOBRAL BLANCO (1905-1990) MOP-JCETS</div> <div>JOSÉ COSTA E SILVA (1913-????) MOP-JCETS</div> <div>Liceu Rehabilitation [3B + S] author</div> <div>project1943194619471951</div> <div>work started</div> <div>inauguration</div> <div>ARCH 2MANUEL FERNANDES de SÁ (1943-)</div> <div>2007200830-012010</div>					<div>1951</div> <div>2007</div> <div>2011</div>		
LICEU INFANTA D. MARIA							
<div>Liceu [girl's school] author Owner</div> <div>MANUEL FERNANDES de SÁ (1903-1980)</div> <div>FRANCISCO COSTA ASSIS MOP-JCETS</div> <div>Liceu Rehabilitation [3B + S] author</div> <div>project19381944194501-101948</div> <div>work started</div> <div>inauguration</div> <div>ARCH 3JOÃO PAULO CONCEIÇÃO (1950-2011)</div> <div>2008200905-102010</div>					<div>1948</div> <div>2008</div> <div>2011</div>		
<div><div><div>OPORTO</div><div>2RF</div><div>5CM</div><div>COIMBRA</div><div>6DM</div><div>LISBON</div><div>0PM</div><div>1PN</div><div>4FL</div><div>BEJA</div><div>3DG</div></div></div>							

LEVEL 0 PLAN

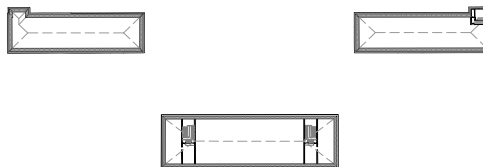
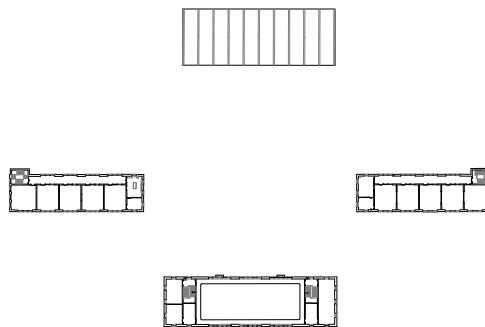
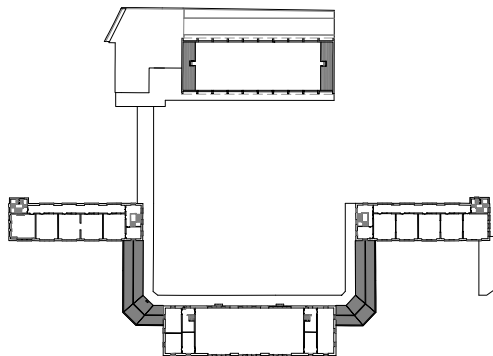
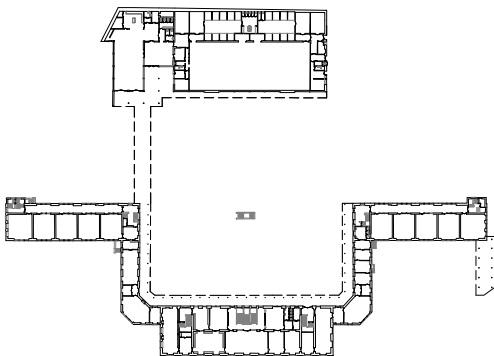
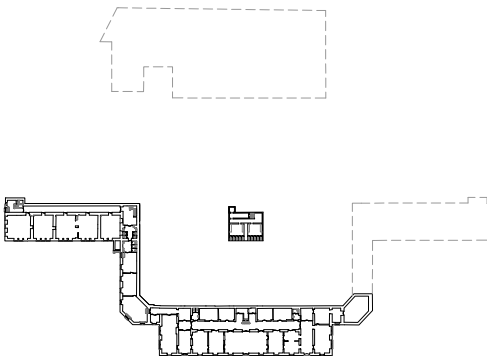
LEVEL 1 PLAN

LEVEL 2 PLAN

LEVEL 3 PLAN

LEVEL 4 PLAN

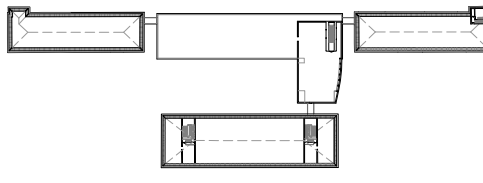
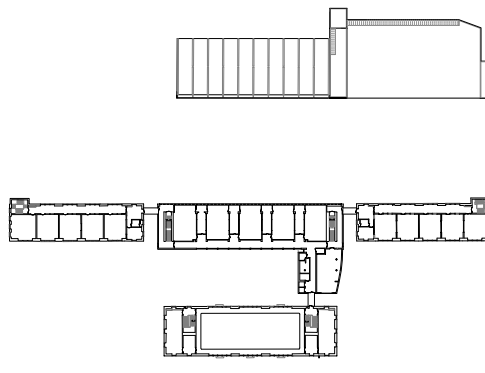
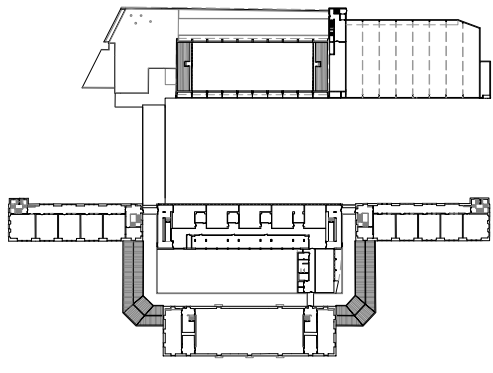
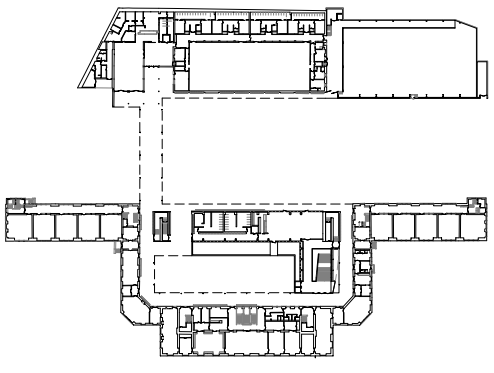
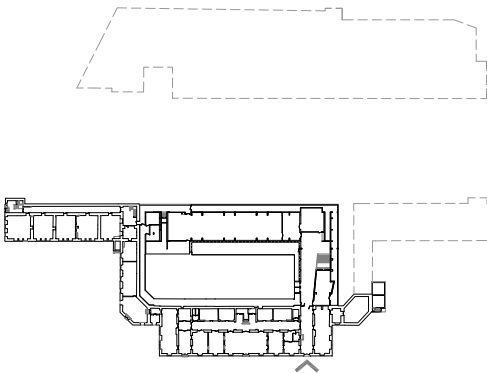
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SURVEY (2007)

REHABILITATION (2011)

FINAL DRAWINGS: PROVIDED BY PVB AND MRB IN 2006.12.30 | DRAWING: JULY 2009; FILE: 2006.07.31



LICEU de PEDRO NUNES 1PN
LISBON ARCH. PEDRO VIANA BOTELHO | MARIA DO ROSÁRIO BEIJA ARCH1

LEVEL 0 PLAN

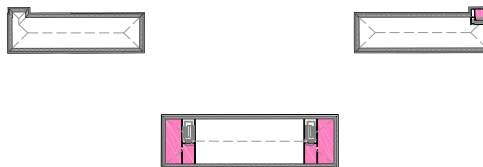
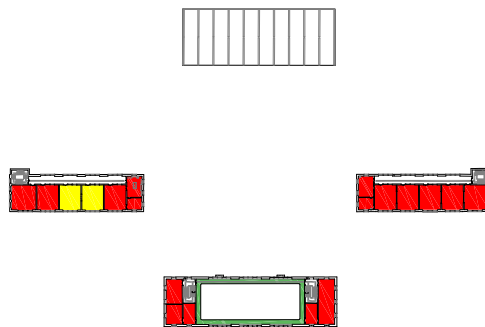
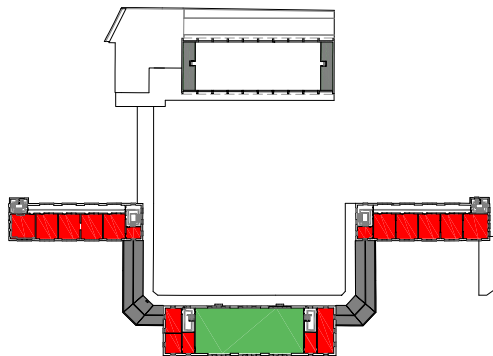
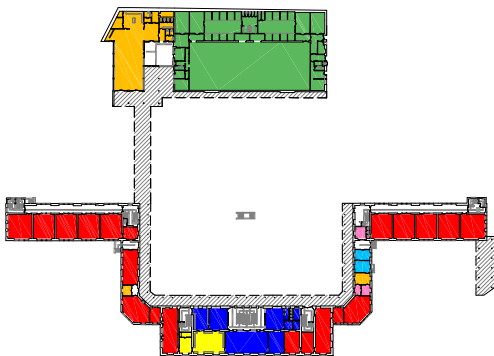
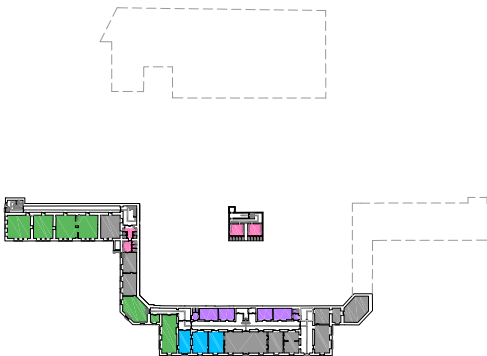
LEVEL 1 PLAN

LEVEL 2 PLAN

LEVEL 3 PLAN

LEVEL 4 PLAN

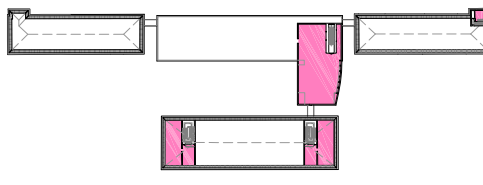
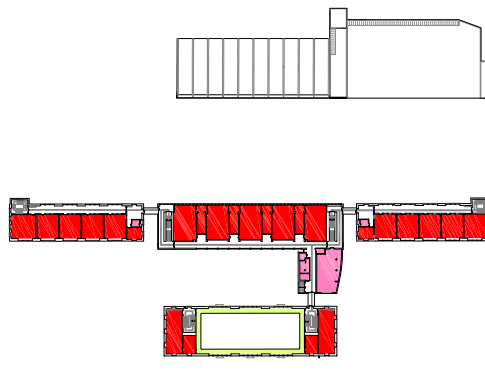
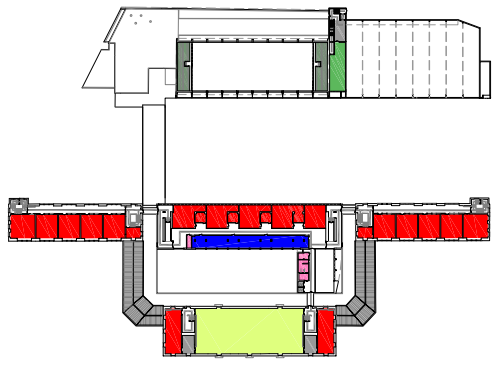
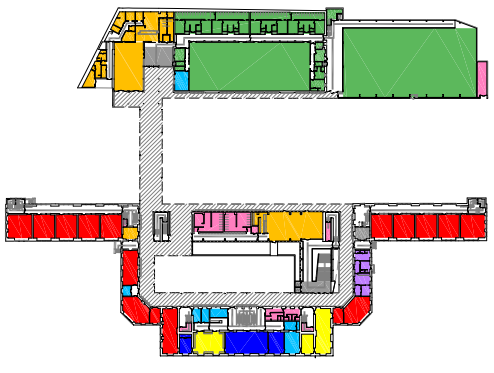
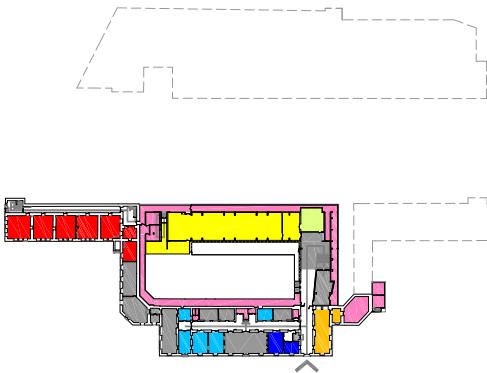
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SURVEY (2007)

REHABILITATION (2011)

FINAL DRAWINGS: PROVIDED BY PVB AND MRB IN 2008.12.30 | DRAWING: JULY 2009; FILE: 2009.07.31



- LEARNING (GENERAL, ICT ROOMS, SCIENCE LABORATORIES, TECHNOLOGY ROOMS, WORKSHOPS, ART, MUSIC AND DRAMA STUDIOS)
- TEACHERS (COMMON ROOM, PARENT'S ATTENDANCE, WORKSPACES)
- STAFF AREAS (COMMON ROOM, CLOACKROOM)
- SCHOOL BOARD (ADMINISTRATION, SECRETARY)
- ATRIUM, RECEPTION, ARCHIVES, STORAGE
- CATERING AREAS, STUDENTS STATIONARY AND SOCIAL AREAS

- HALLS (MULTIPURPOSE ROOM)
- SPORTS AREAS (GYMNASIUM)
- LEARNING RESOURCES AREAS (LIBRARY, RESOURCE CENTER, MUSEUM)
- SUPPLEMENTARY AREAS (ADULT TRAINING, CONTINUING EDUCATION)
- TOILETS, TECHNICAL PLANT AREAS

- CIRCULATION
- ENTRANCE
- COVERED AREAS
- EXTERIOR COVERED AREA

LICEU de PEDRO NUNES 1PN
LISBON ARCH. PEDRO VIANA BOTELHO | MARIA DO ROSÁRIO BEIJA ARCH1

ARCHITECTURE AND FUNCTIONS: LEVEL PLANS
[SURVEY, 2007 | REHABILITATION, 2011]

0 25 50 75m



LEVEL 0 PLAN

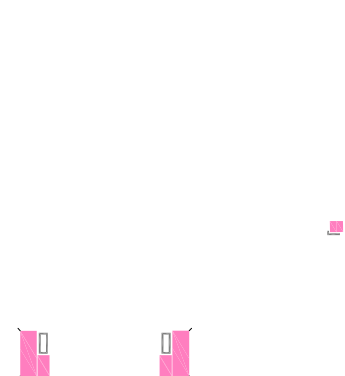
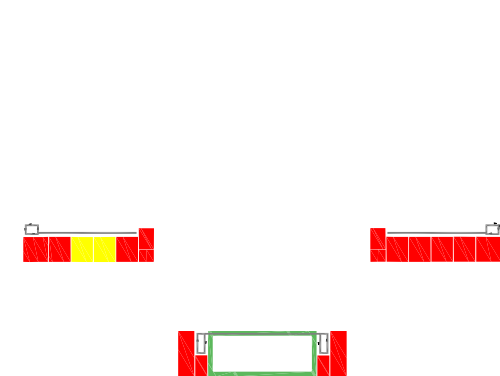
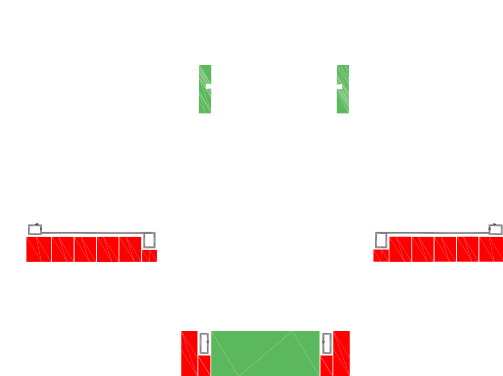
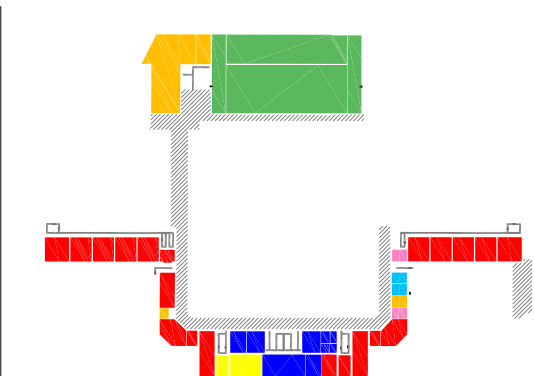
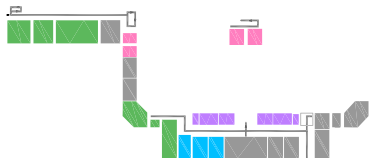
LEVEL 1 PLAN

LEVEL 2 PLAN

LEVEL 3 PLAN

LEVEL 4 PLAN

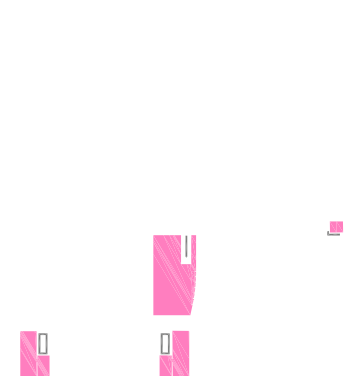
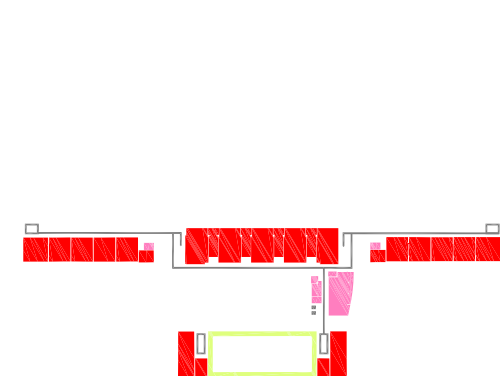
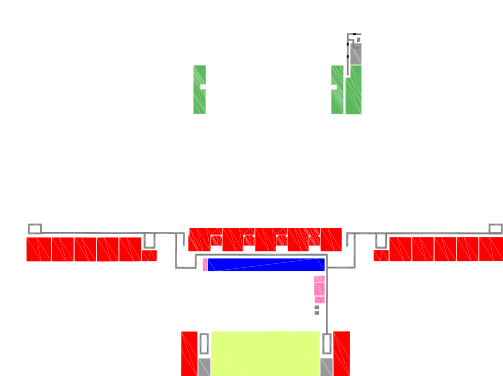
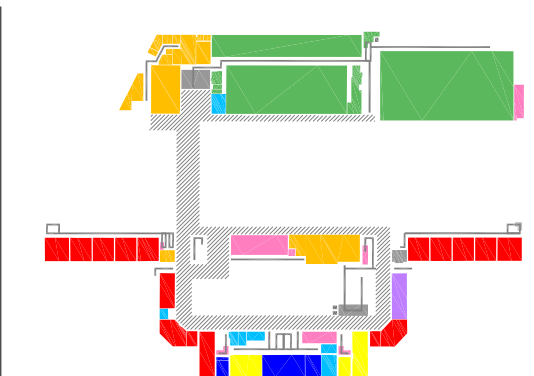
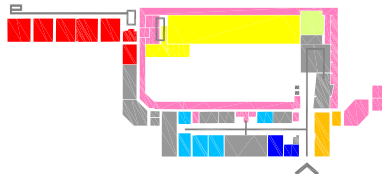
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SURVEY (2007)

REHABILITATION (2011)

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- LEARNING (GENERAL, ICT ROOMS, SCIENCE LABORATORIES, TECHNOLOGY ROOMS, WORKSHOPS, ART, MUSIC AND DRAMA STUDIOS)
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- CIRCULATION
- ENTRANCE

LICEU de PEDRO NUNES 1PN
LISBON ARCH. PEDRO VIANA BOTELHO | MARIA DO ROSÁRIO BEIJA ARCH1

FUNCTIONAL-SPATIAL DIAGRAMS
[SURVEY, 2007 | REHABILITATION, 2011]

LEVEL PLANS

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